DOCUMENT RESUME

ED 353 947 HE 026 209

| | |
|---|---|
| TITLE | Case Study for FORD/SHEEO Project on Systemwide Database and Institutional Support for Minority Student Achievement. |
| INSTITUTION | Colorado Commission on Higher Education, Denver. |
| PUB DATE | 31 Aug 90 |
| NOTE | 154p. |
| PUB TYPE | Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160) |
| EDRS PRICE | MF01/PC07 Plus Postage. |
| DESCRIPTORS | Academic Achievement; Academic Persistence; Administrator Attitudes; College Students; Community Colleges; *Data Analysis; *Databases; Data Collection; Educational Environment; Higher Education; *Information Dissemination; *Minority Groups; Public Colleges; *School Holding Power; Student College Relationship; Teacher Attitudes |
| IDENTIFIERS | *Colorado |

ABSTRACT

This study evaluated the first phase of a three-phase project to improve baccalaureate achievement rates of minority students in Colorado. The activities of the first phase included gathering more and better data on the progress of students, analyzing those data, and using that analysis to choose and visit institutions that seem to be succeeding with minority students. The evaluation of the data gathering process for a Cohort Tracking System on student performance in Colorado institutions of public higher education indicated that Colorado had an effective decision-making support system for interfacing various data resources and that all available data from 1986 to 1990 could be loaded. During the first year of operation 3 years of data were loaded, resulting in approximately 175,000 master records on students. In addition, after the first year of use retention measures were developed and the capacity to produce a variety of types of reports and studies was established. Evaluation of the minority retention measures and their implementation found that few institutions had large entering cohorts of minority students and that retention needed to be defined differently for 4-year and community colleges. Evaluation of the campus visits found that, though certain campus efforts were important, faculty and administrators felt that, ultimately, solutions were beyond their control or out of their realm of responsibility. The report includes extensive appendixes that comprise the bulk of the document. They provide technical information on the development of the database and the retention measures, and include interview protocols. (JB)

**********
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
**********

ED353947

HE

CASE STUDY FOR FORD/SHEEO PROJECT
ON

*YSTEMWIDE DATABASE AND INSTITUTIONAL SUPPORT*
*FOR*
*MINORITY STUDENT ACHIEVEMENT*

BEST COPY AVAILABLE

# COLORADO COMMISSION on HIGHER EDUCATION

HE026209

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
CO Comm on H.E.
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
■ This document has been reproduced as received from the person or organization originating it
□ Minor changes have been made to improve reproduction quality
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

# CASE STUDY FOR FORD/SHEEO PROJECT
# ON

## *SYSTEMWIDE DATABASE AND INSTITUTIONAL SUPPORT FOR MINORITY STUDENT ACHIEVEMENT*

SUBMITTED BY THE
COLORADO COMMISSION ON HIGHER EDUCATION

AUGUST 31, 1990

TABLE OF CONTENTS


INTRODUCTION . . . . . 1

PROJECT DESCRIPTION . . . . . 5
- Goals . . . . . 5
- Collaborative Involvement . . . . . 7

EVALUATION . . . . . 12
- Tracking System . . . . . 12
  - Successes
  - Products
  - Changes
  - Outcomes
- Development of Minority Retention Measures . . . . . 15
  - Successes
  - Products
  - Changes
  - Outcomes
- Campus Visits . . . . . 19
  - Successes
  - Products
  - Changes
- Reactions by Institutions . . . . . 24
- Implications for the Governor, Legislature, and Other External Groups . . . . . 25

CONCLUSION . . . . . 26
- Next Steps for CCHE . . . . . 26
- Prospects for Increasing Minority Achievement . . . . . 26

APPENDICES
- A: The Development of the Cohort Database: Technical Report
- B: Development of Minority Retention Measures
- C: Interview Protocols
  1. Administrative Survey
  2. Faculty Survey
  3. Student Survey

# INTRODUCTION

The CCHE recognizes that growing numbers of minority students combined with disproportionately low rates of graduation has created a problem that merits state attention. Although 17 percent of the state's current population are minorities, only 8.4 percent of current enrollments in higher education are minority students and only 5.9 percent of baccalaureate degrees and 12.6 percent of associate degrees are awarded to minority students. Increasing minority student participation rates becomes even more critical in the future because minorities will represent one-fifth of the state population by the year 2000, and one-fourth of the population under 25 years of age will be minority.

To help address this educational imbalance, in 1985 the Colorado legislature passed HB 1187, which directed the CCHE to develop several major policy initiatives, including affirmative action for the state's public system of higher education. In June 1988, after extensive analysis and discussion with the state's higher education boards and their institutions, the Commission adopted a set of statewide affirmative action initiatives.

These initiatives fall into five categories:

- Assuring that minority students come to college better prepared.
- Reducing financial barriers to college attendance for minority students.

- Providing incentives to institutions of higher education to do a better job in serving the needs of minority students.

- Supporting those institutions that are already doing a good job.

- Changing the culture of higher education, so that the environment is more receptive/less hostile to minority students.

To assure that minority students come to college better prepared, the Commission has encouraged the institutions to increase their attention to pre-collegiate programs. There is a growing number of pre-collegiate programs on each campus; institutions are currently discussing ways to coordinate these activities statewide and avoid duplicating efforts in some high schools while neglecting others.

To reduce financial barriers to college attendance for minority students, the Commission established the Colorado Diversity Grant program, which was implemented in the Fall of 1988. While this program is not directed exclusively to minority students, but rather to all underrepresented groups in higher education, a large share of the resource is going to minority students. One out of every four new dollars for state financial aid over the last two years have gone to this new diversity grant program. In its first year (1988-89) the program received $187,000. This year (1989-90) nearly $500,000 will be provided through this program.

In its current budget request, the Commission is pursuing an increase of $19.5 million for need-based grants. While this request does not explicitly target

resources to minority students, currently 21% of state need-based grants go to minority students, a share that will likely increase in the future.

The Programs of Excellence program provides incentives to institutions to better serve minority students. The Commission has included affirmative action as a specific criterion in the selection of these programs. It also has incorporated affirmative action goals and measures as a requirement in each institution's accountability plans, which were recently approved by the Commission.

To support those institutions that are already doing a good job of serving minority students, the Commission established the policy of providing financial incentives through the "reexamination of the base" process, which determines the allocation of state appropriations to the various systems and institutions. This financial incentive was first implemented for the FY 1990 budget. By next year, over $3.6 million will be reallocated through this process.

To change the culture of higher education so that the environment is more receptive to minority students, the Commission directed staff, in consultation with governing boards, to develop an administrator/faculty development fund, which the Commission would administer and which would receive private as well as public money. This fund will seek to assist institutions in attracting, retaining, and promoting underrepresented groups within the faculty and administrative ranks. This piece of the Commission's set of initiatives is still in its planning stage. It is on the Commission's work plan for this year, and was the subject of a seminar on minority faculty, which the Commission sponsored with a coalition of organizations interested in minority education.

The Commission is also involved in an effort to establish a Colorado Minority Education coalition, a public/private collaborative to increase the educational participation and success of Colorado's children of color through information sharing, policy analysis, program development support, and advocacy. This group has met on three occasions and is currently investigating possible organizational structures.

All of these initiatives require accurate collection and comprehensive analysis of student data. CCHE used the SHEEO/Ford grant to develop a system for tracking student cohorts, analyze the data generated by this system, and visit five campuses to discuss ways to improve the performance of minority students (see "Project Description" section below). These activities constitute phase one of a three-phase process, the last two phases include the identification of financial incentives for improving minority participation, the evaluation of current state policy, and possibly the formulation of new legislation.

Though work now continues on phases two and three, completion of the development phase is itself a substantial achievement. (See "Evaluation" section below.) The stage has been set for continuing progress in Colorado's efforts to retain and graduate minority students.

## PROJECT DESCRIPTION

### Goals

The goal of this three-phase project is to significantly improve baccalaureate achievement rates of minority students. The activities of the first phase include:

- gathering more and better data on the progress of students than has been available so far;
- analyzing those data;
- and, using that analysis, choosing and visiting institutions that seem to be succeeding with minority students.

Phases Two and Three of this project will include a systematic review and evaluation of all state level policies to determine if the current policies adequately encourage the types of activities that lead to minority student success or are disincentives that discourage institutions from implementing the identified success factors. Funding formulas and state level policies will be adapted to reward and support replication of those common success factors across all programs and institutions in the public system of higher education.

Specific outcomes of the total project are:

1. Development of a student tracking mechanism that will improve Colorado's information base on institutional and

systemwide measures of minority student retention, achievement and graduation. (Later applications may also allow the Commission to learn about the employment success of its educated minority constituents.)

2. Identification of common factors across institutions that promote minority student success.

3. Development of financial incentives that directly support the replication of those common success factors in programs, disciplines and institutions.

4. Evaluation and modification of state level policies to ensure coherence and relevance in supporting what has become a major state level imperative.

5. Formulation of new legislative action required to support the state goal of increasing higher education's performance in educating minority students.

6. Support of the transfer function to ensure its viability in assuring minority student success in higher education.

Collaborative Involvement

For help in developing a tracking system, analyzing data, and setting up the protocols used during campus visits, CCHE staff was assisted by consultants. One set of consultants helped with the development of the database necessary to support information gathering. A second set of consultants performed the analysis of the longitudinal data, and a third set designed the protocols needed for campus visits and then participated in the visits.

In its work on all three major components of this project, the CCHE drew on the advice of outside groups. The Commission's Data Advisory Group, made up of institutional research staff of the various governing boards, reviewed the structure of the tracking system, the analysis plan, and the draft reports on the progress of minority students at two-year and four-year institutions. The Commission's Academic Council, which consists of the chief academic officers of Colorado's six governing boards, was consulted about financial incentives. The institutional registrars, academic advisors, and administrators who make up the Commission's Transfer Advisory Council reviewed the process for consistency with the existing transfer policy. Two advocacy groups, the "Black Roundtable" and the higher education committee of the "Hispanic Agenda", received copies of the data analysis and were included in discussions of project activities.

CCHE also turned outside for members of the teams that visited campuses. Although an academic affairs officer from CCHE was on each team, each also included a consultant who had co-authored the interview protocols, the SHEEO

project officer, and a representative of a governing board other than the institution's own board.

Members of other external groups were not otherwise involved at this stage of CCHE's efforts, nor were the governor or legislators. Their participation will, however, become vital as the second and third phases begin.

Student Cohort Tracking system. Before CCHE could modify or develop new policies to promote minority achievement, staff had to gain an understanding of the actual participation and achievement of minority students within the state institutions. Staff also needed a mechanism for evaluating the impact of policies and programs on student retention rates.

Prior to the SHEEO/Ford Grant, CCHE's data collection system could provide only simple demographic statistics on ethnic minorities. Of equal concern, the individual student file approach did not easily permit staff to conduct long term studies that track students across institutions. The Commission recognized as a high priority the need to create an information system that was more flexible and could integrate its various student files.

CCHE used the SHEEO/Ford Grant to develop a system that would track minority students along every point of the higher education pipeline. The Commission built the Cohort Tracking System around its Student Unit-Record Data System (SURDS). (This system collects data from all public, postsecondary institutions in the state including fall enrollment data and full year data on undergraduate

applicants, degrees granted, and financial aid. All data records identify the student's race/ethnicity.)

Traditional cohort systems track an entering group of students for a specified series of years. The Colorado system differs because it tracks students from multiple enrollment points. It is both entry and exit point orientated. An extract file can be structured for any base year, independent of the selection criteria. The user may specify a chronological or reverse chronological order of the data depending on the application. Since student entry and exit points can be significant factors in measuring the success or failure of a policy, it was important that the system not be restricted to entering cohorts alone.

Secondly, the system has minimal impact on staff resources for file maintenance or processing. There are only three defined extract files: a seven-year enrollment extract file, a seven-year financial aid extract file, and a single year file. A limited number of extract files is feasible because of the wide range of selection criteria and various file specification options make the three extract files extremely flexible.

The third advantage of this system is its interactive process for extracting data files. Although the tracking system resides on a mainframe, the method for all file processing is user-sensitive. Menu driven screens with customized, on-line help facilities are utilized. This allows greater access to the data for all levels of users. Access is not dependent upon the availability of database specialists.

This new system provides detailed data on high school academic preparation of all four-year applicants, inter-institutional transfer information, specific program information, financial need and financial aid awards of applicants and recipients, as well as demographic descriptors. The primary application of this data will be to measure the effect of educational constraints on the performance of minority students (for example, the responsiveness of Colorado postsecondary institutions to changing minority high school graduation rates, and the impact of institutional and statewide policy on minority retention.)

A more detailed description of the design and development process is included as Appendix A (a separate document).

In addition to the development of a tracking system, CCHE analyzed the data and developed measures that reflect the level of minority retention in the state's public postsecondary institutions. Using this analysis, a project team visited institutions to learn of the qualitative factors that aid or impede minority student success.

Reports on Minority Participation. CCHE produced a report using student data from fall 1986 to fall 1988. The report focuses on retention and participation, desegregated by race and ethnicity, at four-year institutions and community colleges. The report was completed in fall 1989, and is attached as Appendix B (a separate document).

Campus Visits. Three criteria were used to select campuses for site visits: location, mission, and statistics on minority retention. (How the institutions were selected is discussed in detail in the Evaluation Section (pages 24-25) of this case

study.) By March 1990, CCHE staff conducted interviews at five institutions. The interview protocols are presented in Appendix C (a separate document). Site visits were made to Adams State College, Front Range Community College, Colorado State University, and the University of Northern Colorado. And due to inclement weather, an interview was conducted by telephone with Trinidad State Junior College. These were one-on-one discussions with the institution's president, chief academic officer, chief student affairs officer, other administrators, directors of special programs for minority students, faculty, and students.

## EVALUATION

The purpose of this project was to lay the groundwork for change--to gather the information that will be essential to creating workable incentives to improve the participation of minority students. This has been accomplished, although not all parts of the project developed precisely as they were planned.

Each component of the project is assessed separately below in terms of its success, its products, the changes that took place as work proceeded, and outcomes. Larger consequences are also considered--the reactions of institutions and the broader community, the implications for the governor and the legislature, the next steps for the CCHE, and the likelihood that the project as a whole will increase minority achievement.

### Tracking System

Successes: One significant success of the Minority Retention project is the actual implementation of the Cohort Tracking System, a data system that provides information on student performance within Colorado public postsecondary institutions. Within the first year, Colorado completed the following database activities: initial study of user needs, analysis of current system, exploration of alternative solutions, design of new system, implementation of the solution, and evaluation of the working system. The evaluation of the Cohort Tracking System indicated that Colorado had an effective decision-making support system for interfacing various data resources that provided both inquiry information and analysis files. At this point, Colorado is able to load all available data from 1986

to 1990 and can begin processing on a scheduled basis. The long term success of this project is to follow students at the time of entry through graduation from colleges and universities in Colorado. This goal will be met for the first student cohort in 1991, when the database will have five consecutive years of student data.

Products. The initial output of the system was a file of three years of educational activity of first-time freshmen. (See "Development of Minority Retention Measures" below for a discussion of how these data have already been used.)

Changes.

During the pilot year of operation (1989-90), three years of data were loaded. This resulted in approximately 175,000 master records or unduplicated students on the system. The other files, in particular the enrollment file, were larger since a single student could be enrolled at multiple institutions for multiple terms. All further processing was suspended during the test year until after an evaluation.

After the first year of use, the Cohort Tracking System was evaluated by CCHE's Information and Research staff and the consultants who developed the retention measures. The database design and file structure were implemented as planned. However, one long term change made to Commission policy as a result of this project is to collect data for spring and summer terms as well as fall data. Both participating institutions and Data Advisory Group members felt that term-by-term activity was a better indicator of student retention patterns than fall-to-fall. The database maintenance modules were modified to allow the inclusion of additional term enrollment data. Additional selection criteria were added for increased

flexibility. There was no change to the extract file layouts as they met the anticipated data needs of the Commission studies.

Outcomes.

In September 1990 all data files from 1985 to 1990 will be re-loaded. Normal file processing will proceed from this point on a pre-determined schedule.

The workplan for the Commission staff is dependent on the availability of the data from this system. Colorado's accountability reports, both statewide and institutional, will rely on the system for retention and completion data, including separate reports by minority groups. The higher education funding process is integrating incentive funding based on affirmative action goals. The measurement of affirmative action success is based on Cohort system data. Special reports and studies scheduled during the coming year include: admissions pools, attendance patterns, impact of transfer policy on enrollment, high school performance summaries, and relationships between attendance and financial aid; all will be based on the extract files available from the Cohort system.

In addition, the data from the Cohort Tracking System is not restricted to CCHE studies. The Commission modified its Data Collection and Privacy Policy to permit institutions access to the Cohort data. The modifications protected financial aid data that cannot be released. Institutions may conduct studies on the statewide data provided by the Cohort Tracking System, thereby allowing the entire public higher education system to benefit from the shared studies. Already a number of institutions and governing boards have made requests for extract files. Some examples of the research and analysis applications are: a comparative study that

Two basic measures were developed for four-year institutions: (1) within-school retention, percent of entering cohort enrolled at school of origin for all three fall terms; and (2) within-system retention, percent of entering cohort enrolled at any public institution within the system for all three fall terms. The statewide within-school rate is 53% and the within-system rate is about 63%. The difference represents the percent of the entering cohort that transferred to another institution during the three year period. Both retention measures vary widely across minority groups and institutions. The within-school rate ranges from 54.1% for whites to 27.4% for Indians, and is 45.4% for Hispanics and 36.4% for blacks. The pattern for the within-system measure differs, it ranges from 64.0% for whites to 32.6% for Indians, but the Hispanic within-system rate is much higher, 67.8%. The within-system rate for blacks is 46.1%. Hispanics appear to be much more likely to transfer, and thus have the highest within-system rate.

The within-school retention rate varies widely across institutions: from a high of 66.4% at a major research university to about 34% to 38% at several of the state's four-year colleges. Similarly, the within-system rate ranges from 72.1% at a research university; to rates in the low 50's at several state colleges. The likelihood of transferring also varies widely across institutions, ranging from 20% to 4%.

For the community colleges, a different approach was taken. A new measure, called "success" rate, was developed that is composed of three factors: (1) continued enrollment, either at school of origin or at another Colorado public community college; (2) receipt of a two-year degree or certificate; and (3) transfer to a four-year institution, either with or without a degree. In addition, since the

assesses the employment status of students who complete a degree program against those that do not complete a program, and a retention study to identify the group of students who leave an institution and do not enroll in any other Colorado institution.

Development of Minority Retention Measures

Successes. Information drawn from the cohort tracking system was used to develop retention measures for the progress of all students at Colorado public institutions who enrolled as first-time freshmen in 1986. The cohort was divided into five racial ethnic groupings--non-Hispanic whites, Asians, blacks, American Indians, and Hispanics; non-resident aliens and students with unidentified ethnicity were excluded from the analysis file. The goal was to develop measures of retention and to search out, if possible, patterns of retention by minority groups and by institutions.

One fact quickly became apparent. Very few institutions have large entering cohorts of minority students. To avoid the errors that are likely in analyses based on small numbers, and to protect confidentiality of information about individual students, retention measures were not reported for cohorts that contained fewer than 10 members.

Another conclusion from the preliminary data analysis was that, in order to recognize differing roles and missions and differing intents of entering students, retention needed to be defined differently for four-year institutions than for community colleges.

ultimate goal of the study is to improve baccalaureate degree achievement by minority students, the percent of the cohort transferring to a four-year institution was separately analyzed. These measures were also computed for full-time and part-time students and for students starting in vocational and two-year degree programs.

The success rate for the entire community college cohort is 32.0%. This varied by minority group similarly to the variance in the four-year analysis: from 33.1% for whites to 20.5% for Indians, with Hispanics at 29.3% and blacks at 25.3%. For just the transfer rate measure, the cohort average was 9.8%. This ranged from 10.8% for whites to 5.2% and 5.1% for blacks and Hispanics, respectively. The Indian transfer rate was 8.0%. This contrasts from the four-year analysis where the Indian cohort appeared to be least likely to transfer.

These rates also varied widely across institutions. Success rate varied from a high of 56.6% to a low of 17.4% with several others in the low 20's. The transfer rate had a similar range of variance, ranging from 32.3% to a low of 6.2%.

Products. A report was produced as part of this project, "Development of Minority Retention Measures", (see Appendix B, a separate document).

Changes. The report, which was drafted a number of times and reviewed by the Data Advisory Group, took a form somewhat different than that anticipated. Because the numbers of students in particular programs who could be isolated by ethnic group were in many instances too small for safe generalization, it proved impossible to identify exemplary programs. Though the consultants next looked

at larger units--at schools of business, for example, or colleges of arts and sciences--the concentrations of minority students were still insufficient for accurate generalizations. These difficulties led to the decision to use entire institutions as the units of analysis.

The decision to group separately four-year institutions and community colleges, also taken on the advice of the Data Advisory Group, was a second modification of original intentions. Behind this decision lay differing definitions of success for minority students. At four-year institutions, a successful outcome was defined graduation, but at community colleges it was defined to include acquiring either a degree or a certificate, remaining enrolled at a state community college, or transferring to a four-year institution.

Outcomes. The reports have already been the basis for considerable discussion. They should have further use as CCHE delves more deeply into issues of financial incentives and legislative initiatives.

The developed measures will be expanded and developed further in phase two of the project. The CCHE staff and Data Advisory Group agreed that the analysis in phase one, while informative, needs to be expanded to include factors such as full-time/part-time status before firm conclusions of relative performance can be drawn.

A more immediate outcome has been to make members of the CCHE, the Data Advisory Group, and the Academic Council more familiar with the data on minority students. As the analyses were reviewed, everyone gained a statewide

Due to limited time and resources, only three four-year institutions could be visited. It was also decided that the visits should be distributed across governing boards, urban and rural location, and level of instruction. Colorado State University and the University of Colorado at Boulder were the two highest rated institutions in Figure 1, followed by the University of Northern Colorado. Colorado State and Northern Colorado were chosen for site visits. The third choice was more difficult. Adams State College was chosen as a rural institution with a large percentage of Hispanic enrollment and fairly high overall performance relative to the other state colleges, as displayed in Figure 1.

Similar indices were also developed for the community colleges: (1) success rate expressed relative to the success rate for all students of the same ethnicity, (2) success rate expressed relative to the success rate of whites at the same school, (3) percent of students transferring to a four-year school expressed relative to the transfer rate of all students of same ethnicity, and (4) percent of students transferring to a four-year school expressed relative to the transfer rate of whites at the same school. As with the four-year analysis, indices (2) and (4) were judged to be the most important. These indices were also combined to rate institutions (see Figure 2). As with Figure 1, the ratings implied in Figure 2 should be used with caution. Further analyses in phase two, that include more years of data and additional factors, may change the relative rankings.

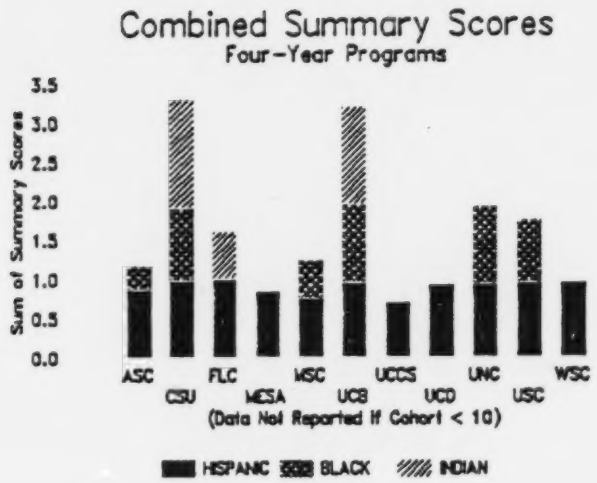
Two community colleges were chosen for site visits, one urban and one rural. Several of the urban community colleges had similar ratings in Figure 2: Front Range Community College, the Community College of Denver, and Arapahoe Community College. Front Range was chosen for the site visit. Of the rural

perspective on high school graduation rates, applicant pools, baccalaureate degree production, and patterns of enrollment, attendance, and transfer. This greater familiarity with statewide circumstances helps in making more informed decisions about institutional initiatives in response to state directives.

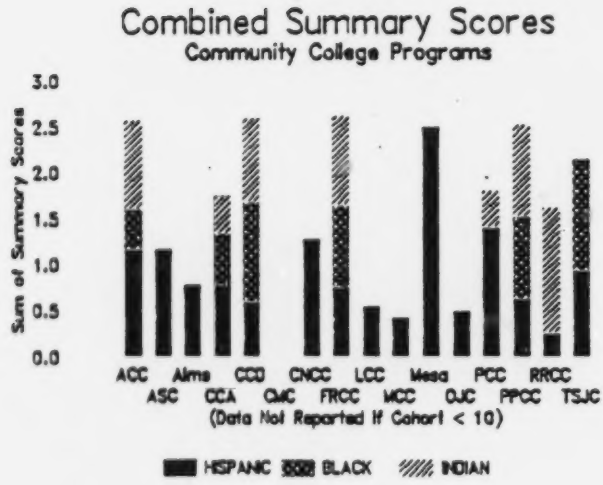
Campus Visits

Successes. In order to identify institutions where minority students had a better chance of succeeding, indices were developed from the basic retention measures that were developed. For the four-year institutions, four indices were developed: (1) within-school retention rate expressed relative to the retention rate for all students of the same ethnicity, (2) within-school retention rate expressed relative to the retention rate for whites at the same school, (3) within-system retention rate expressed relative to the retention rate for all students of the same ethnicity, and (4) within-system retention rate expressed relative to the retention rate for whites at the same school. Indices (2) and (4) were judged to be particularly important since they help to control for the fact that some institutions are more selective and all entering students are expected to have higher retention rates. A weighted average of the four indices was computed as a summary measure, and these measures were then graphed for Hispanics, blacks, and American Indians (see Figure 1). The implied ranking of institutions in Figure 1 should be used with caution. It reflects the analysis in Appendix B, but the rankings may change significantly when additional factors are included in future analysis and when more years of data are available.

# Figure 1[1]




# Figure 2[1]




[1]Caution should be used in inferring the relative ranking or performance of institutions in this graph. The graph summarizes measures developed in Appendix B, "Development of Minority Retention Measures". Future refinement of the analyses, especially including additional factors such as full-time/part-time status, may change the relative rankings of the institutions.

community colleges, Trinidad State Community College had the highest overall rating in Figure 2 and was chosen for the site visit.

Products. For each institution, team members compiled and analyzed the results of their individual interviews in composite surveys of program directors, faculty, administrators, and students. This analysis is the basis for staff observations. During the site visits, administrators were surveyed concerning such items as minority retention strategies, barriers, faculty involvement, and financial support to minority programs. Typical administrator comments were:

- "Minority students are mainly first generation students who do not have a long tradition within higher education."

- "Family ties are stronger than educational ties"

- "First generation students don't want to appear dumb so don't ask basic questions."

- "Minorities lack a sense of identity as it relates to campus life.

- "Campus climate is poor: few majority students value diversity"

- "Administration needs to embrace minority students, not just teachers."

- "Many rural high schools don't have resources to prepare students well. Need to provide tutorial services without stigma."

In addition to many of the same items included in the administration survey, faculty and students were asked questions about: academic integration, social integration, educational goals, and attitudes.

Changes. The single major modification of the proposal procedures was the decision to look not at exemplary programs but rather at institutions.

Outcomes. Responses from administrators, faculty, program directors, and students clearly reflected their own perspectives. Administrators felt that the most effective strategies for minority retention are financial aid scholarship funds and pre-collegiate programs. Faculty believed advising and counseling made the greatest difference in retention of minorities and learning/cultural centers the second most successful approach. Students, on the other hand, felt strongly that learning/cultural centers had the greatest impact on retention and the availability of financial aid was the second contributing factor. Staff analysis identified four themes that are worthy of note here and of follow-up activity in stages two and three of the project:

1. Ethnic-specific student service centers (cultural centers) are extremely important to minority student success in higher education. Existing centers provide such services as

counseling, tutoring, peer and faculty mentoring, orientation, grade monitoring and social activities.

2. There is a lack of faculty and administrator awareness and sensitivity to minority attitudes and issues.

3. Generally, institutional faculty and administrators recognize problems of minority students' retention and graduation rates, but see solutions as out of their control or realm of responsibility.

4. Financial constraints such as rising tuition costs and lack of scholarships are frequently cited as barriers prohibiting academic success.

These conclusions have already begun to shape CCHE's development of financial incentives and other policy initiatives, especially by the Academic Council in its deliberations in setting graduation goals for minority students for the next ten years.

Reactions by Institutions

Public institutions of higher education in Colorado have been generally helpful in the execution of this project and cautiously optimistic about its potential. In only one instance did the head of an institution seem to fear that talking about his successes with minority students would cause CCHE to steal his good ideas and

pay other schools to copy them. (In fact, it seems that the strategies that are working well in this school are the same ones that are working well elsewhere.) In general, though, campus visits contributed to the creation of a more positive climate for the discussion of financial incentives. Where such incentives had earlier been seen as punitive, they were now more generally understood to represent CCHE's effort to support institutions in their efforts to improve their response to minority students.

Support is still far from universal for the idea that the achievement of minority students is a reflection of an institution's performance. But more and more institutions are taking an active interest in how they can allocate money and support programs that improve the circumstances of minority students and minority faculty. Though Colorado colleges and universities are unlikely to attribute their interest to CCHE activity, this interest is growing at the very time that further action by CCHE is anticipated.

Implications for the Governor, Legislature, and Other External Groups

Although advisory groups were consulted extensively during this phase and they were in several instances responsible for fairly substantial modifications of procedure, the time has not yet come to turn to elected state officials and the larger public. Their involvement is anticipated as CCHE assesses current policies and proposes new ones.

# CONCLUSION

## Next Steps for CCHE

The work of phases two and three remains to be done and, as CCHE's proposal to SHEEO suggested, it is substantial. Once the Commission has further defined and refined financial incentives to improve participation by minority students, it needs to implement those incentives. CCHE will be paying special attention to findings of the campus interview, pre-collegiate preparation, faculty-staff diversity, increasing financial aid. It must also review its policies and revise those that seem to be inhibiting progress for minority students. Thereafter, it faces the major challenge of developing legislative initiatives that support the efforts of institutions of higher education.

## Prospects for Increasing Minority Achievement

The grant from the Ford Foundation has strengthened the Commission's minority policy-development agenda in three ways: 1) it now has the capacity to track the progress of minority students, 2) it has retention measures that can be used to measure the extent to which minority students are completing their educations, and 3) it has some sense of what helps or hinders minority students success. The challenge now is to continue moving on the agenda that the grant activities have helped to define. CCHE pledges to complete the next two phases of this overall effort. The Commission pledges to increase minority achievement in Colorado.

# APPENDIX A

# THE DEVELOPMENT OF THE COHORT DATABASE: TECHNICAL REPORT

I. PROBLEM STATEMENT . . . . . 1

II. CURRENT DATA ENVIRONMENT . . . . . 2

III. LIMITATIONS OF EXISTING SYSTEM . . . . . 5

IV. DESIGN OF THE COHORT SYSTEM . . . . . 6
File Structure . . . . . 11
Cohort definition and identification . . . . . 12
System Design Criteria . . . . . 13
File layout and construction . . . . . 14
Extract and analysis . . . . . 15

V. IMPLEMENTATION . . . . . 22
STEP ONE: Construction of System . . . . . 22
STEP TWO: Integrity Control . . . . . 32
STEP THREE: Systems Testing . . . . . 33
STEP FOUR: Modification of the Design of Extract Files . . . 33
STEP FIVE: Development of Extract Environment and Processing . . . . . 33
STEP SIX: Comprehensive Review . . . . . 38
STEP SEVEN: System Documentation . . . . . 39

The following report contains a detailed description of the design and implementation of Colorado's Student Cohort Tracking System (CTS). It is primarily written for a technical audience and provides an overview from the systems design perspective.

# I. PROBLEM STATEMENT

The Colorado Commission on Higher Education (CCHE), which is the central policy and coordinating board of Colorado public higher education, needs the capability to support its decisions with data drawn from diverse sources. In particular, it needs information to support decisions in these four categories:

(1) systemwide accountability,

(2) program management,

(3) strategic planning,

(4) policy monitoring.

Systemwide accountability measures how students benefit from their college experience, how well the Commission is achieving its system-wide goals, and how the system is responding to changing demographics. Through program management, the Commission tracks the persistence of students in higher education, identifying decision points controlled by students (e.g., matriculation, voluntary withdrawal or transfer), and by state policy (e.g., acceptance rates, program approval). Through strategic planning the Commission tracks educational markets, finds new program areas, and determines which policies are most likely to succeed in a changing environment. It also monitors the factors that are important to individual policy issues, the ways policies are being implemented at institutions, and possible changes to Colorado statutes and CCHE policy.

The problem has been that the information available to the Commission has been less usable than it needs to be, particularly as the Commission has tried to assess the participation of minority students in public higher education in Colorado.

## II. CURRENT DATA ENVIRONMENT

The degree that the needs of Colorado's higher education decision makers are met is determined by the available resources: staff, processing capacity, and data. In terms of personnel, there are four information and research (I&R) staff who maintain a wide range of data, conduct the analysis for the majority of the Commission projects, maintain the local area network and, coordinate software implementation, they provide assistance to the staff, approximately 20 professionals who develop policy or monitor programs.

In 1985, the Commission replaced its previous, limited enrollment collection system by requiring all public postsecondary institutions to participate in the Student Unit-Record Data System (SURDS). Implemented to help meet emerging state reporting requirements and to comply with the new federal Integrated Postsecondary Educational Data System (IPEDS), SURDS optimized data collection procedures. It established a common methodology for identifying the types of students to include in the four files--Undergraduate Applicant, Enrollment, Financial Aid, and Degrees Granted--and standardized data elements definitions for the following types of information:

Undergraduate applicant:

When freshman and transfer students apply for admission to a postsecondary institution, they supply information about their academic preparation--their high school GPA, class rank, standardized test scores, prior postsecondary experience, including most recent institution attended, transfer GPA and credits achieved.

Enrollment:

When students enroll at one of Colorado's 28 public postsecondary institutions, they provide two types of information: academic performance and system activity. These indicators may be derived from registration status, cumulative GPA, credit-hour load, student level, program of study, or the change in any of these items from one term to next.

Financial Aid:

When students apply for financial assistance, they supply data on income level and available resources. Financial aid offices supply data on educational budgets, expected family contribution, and types and amounts of aid awarded. These factors can be used to compute the amount of unmet need and to analyze student access based on financial constraints.

Degrees Granted:

When students complete a specific program of study and receive a formal award, they provide academic achievement and exit point information.

A student may appear multiple times on each, or any, of these files: a student may apply to several institutions, enroll in several institutions concurrently or sequentially, apply for financial aid at several institutions, and even complete several different degrees. Multiple appearances within an individual file is not only a possible occurrence but a typical situation since it indicates continued educational activity.

The SURDS systems collects demographic information as part of each file. Demographic analysis helps to more accurately describe student profiles within the different strata of the higher education system. Sex, ethnicity, date of birth data is collected on all files so there is a complete set of information in this area. Demographic information provides insights to the degree that the Commission is achieving the system higher education goals: quality, access, diversity, and accountability for Colorado's various population groups.

The Commission's data processing occurs in a pc network environment. Remote access to an IBM mainframe is provided through a gateway. The primary use of the mainframe is to store and process data collected in the student unit-record data files. The data is summarized and downloaded periodically from the mainframe in a more manageable format.

The implementation of the SURDS system allowed more comprehensive analysis in the related policy areas. The accuracy, consistency, and completeness of the data allowed the Commission to provide annual reports and analyze general trends.

## III. LIMITATIONS OF EXISTING SYSTEM

After several years, it became apparent that the volume of the data collected in the SURDS system and the growing interest in tracking students over the long term demanded a more efficient system of managing information. But space constraints in the computer environment limited the Commission's ability to manipulate the data for cross-cutting or complex analytical studies. The data was available but difficult to access.

The Commission needs to make strategic decisions about educational programs and policies, recurring operational decisions, and deal with unanticipated, immediate issues. Though the existing data system supplied sufficient information for operational decisions, making strategic and immediate decisions required a more flexible and comprehensive system. Tracking students across time was particularly critical to determining whether the education needs of the minority students were being met.

Hardware and human resource constraints both limited the usefulness of the student data system. Since the Commission leased space and time on another system, it did not have control over the mainframe computing environment. Longitudinally student tracking requires merging several, large files. External constraints on computer space allocation limited the merging function to a maximum of two files. Secondly, although statistical packages were the most expedient development tool, they down-graded the system to the point that these packages could be used only during evening hours. These restrictions made it difficult to conduct development work during a reasonable time frame or with any sense of continuity.

The on-going work load of the Information and Research (I&R) staff did not allow it the opportunity to develop programs for in-depth, system-wide analysis in a timely manner. The staff not only handled all the enrollment projections, admission pool and financial aid analysis but were responsible for all the data collection and processing. Secondly, only two of the I&R staff had significant mainframe expertise.

Although developing a student tracking system had high priority, the reality was that the imperatives of data collection took precedence. Staff in the Information & Research section recognized the need to develop a student tracking system and had the expertise in-house to design this system. But only with some external impetus or support could the system be developed within a reasonable timeframe. The Ford Foundation's Minority Student Achievement Grant awarded by the State Higher Education Executive Officers (SHEEO) was therefore invaluable to the development of a student cohort tracking system.

## IV. DESIGN OF THE COHORT SYSTEM

Designing and implementing a tracking system demands careful attention to a sequence of related issues. First, it is important to determine the purposes of the system, since different purposes will produce different decisions about basic design. Second, the actual data content must be decided and the linkages and priorities of data elements determined. Third, procedures must be established for extracting and manipulating data. Fourth, procedures for maintaining and manipulating the database must be established. Fifth,

results must be presented succinctly so that decisions can be made about academic policy.

During the preliminary design phase, a statement of purpose was transformed into an action plan through a top-down process that moved from the general to the specific. The first step was to form a technical subcommittee of the larger Data Advisory Group[1]. The subcommittee was composed of people who had significant technical and analytical expertise and a high degree of interest in the final outcome of the Cohort system. Five were institutional researchers from higher education governing boards, two were CCHE Information and Research staff.

The second activity was to review the student tracking systems already available, including the National Center for Higher Education Management Systems (NCHEMS) system and one developed at the University of Colorado at Boulder. The NCHEMS model, the "LONESTAR" longitudinal model, was an SPSS-X model with an "entering cohort" orientation. The University of Colorado SAS system also used the entering cohort as the primary analytical unit.

Both systems used a statistical package and neither was compatible with the processing limitations of the CCHE environment. Neither met the complete needs of a Colorado statewide system nor did any other system reviewed fit the requirements. The expense of purchasing database management software ruled out this option. The subcommittee therefore recommended that CCHE develop a custom system.

[1] The Data Advisory Group is a group of institutional researchers representing each governing board and/or institution. They provide technical guidance and advice about data-related issues or new project initiatives that impact data collection or use.

The third activity was to define the system design criteria. These criteria would be used to guide the design and to evaluate the design quality and the effectiveness of the actual system, once implemented. Completeness, commonality, coverage, coordination, and control were defined as the most critical design criteria.

One of the underlying values of a student tracking system is completeness: providing a complete profile of individual students. Absence of data is an indicator as well as presence of data. The subcommittee therefore decided to track only those students who had the potential for a complete data file.

The group of students to be included in the tracking system must meet one of the following criteria:

- enrolled as a degree-seeking student at a public postsecondary institution;
- enrolled in resident instruction credit;
- applied for admittance to a public postsecondary institution;
- financial aid applicants at a public postsecondary institution.

The subcommittee further decided that multiple enrollments during the same term should be kept on the file and update and extract modules should be sensitive to these duplicate occurrences.

Commonality deals with common data definitions and consistent interpretation of data elements. Since the source data for Cohort came directly from the SURDS system, SURDS data definitions provided consistency. All participating institutions use the same basis for categorizing students, and the data underwent rigorous verification and editing before it was available to populate the Cohort system. The principles adopted in this area are:

- The system will calculate some values according to algorithms published in Commission policy.

- Such performance parameters as "persistence," "drop-out," and "successful outcome" will be determined in the analysis and not part of the data files.

- The system will produce a set of common extract files, and a common definition code will accompany these files.

- A set of pre-defined, trend reports will be produced, the outgrowths of specific studies that monitor performance across time.

Coverage relates to the degree of detail in the system. The following decisions were made about coverage or which data elements to include and track:

- The system will include the elements that are available on the SURDS file at the lowest level of detail.

- SURDS data elements reported rarely or otherwise suspect will not be included (e.g., date of last attendance).

- Data will be mapped directly from the SURDS file from frozen records after final verification.

- The system will calculate elements (e.g., total credit hours) that are frequently used in analysis to avoid duplicate processing.

- Conflicting data in subsequent reporting will not override initial reporting, except in the case of ethnic data reported on financial aid file.

- Whenever demographic data is reported, it will update any demographic field in which no data was reported earlier.

Coordination and control were important to ensure the integrity of the system. Because the primary purpose of the Cohort system was to provide a statewide view of higher education in Colorado, it was decided that CCHE would implement, operate, and maintain the system. Institutions and governing boards will, however, review the methodology used in specific Cohort studies. The same confidentiality policies that are outlined in the SURDS policy will apply to the Cohort extract files. The Data Advisory Group would be the liaison for reviews of Cohort methodology, suggestions for improvement, and requests to extract files.

From these general decisions, the basic design of the Cohort system took shape.

1. File Structure

VSAM file structure was selected primarily because no commercial database was available in the processing environment nor was money available for the purchase of new software in the Commission budget. VSAM file structure did, however, allow a relational file structure. The benefits of this file approach are:

a. Minimal file maintenance. Using a database approach results in less file processing since each of the input files updates the master file with a few general current educational indicators and adds records to the appropriate detail file. The main concern of the update function is to store "good" data rather than perform file matching or complex transformations.

b. Efficient use of resources. The files extracted from the database are selected using a wide range of selection criteria. Since the user then processes only the data essential to the study or analysis, the resulting file size is controlled. Smaller files require less computer memory and time.

c. Flexibility of use. Since data is extracted from the full array of student information files rather than from static, pre-merged files, the scope of data and degree of detail provided in the extract files can vary, the extract files are not application dependent.

d. Minimum of analyst intervention. A simple method for data access requires relatively few human resources.

e. Adaptability. VSAM files can be loaded into a commercial database management system at some future date.

2. Cohort definition and identification.

All graduate and undergraduate students enrolled in a degree-seeking program are included in the Cohort system. Enrollment data includes fall-only data. Financial aid and completion data are annual data. Undergraduate applicant data includes first-time freshmen, transfer students, and special non-degree students enrolled for the first time (all terms). At present the system covers only students enrolled in Colorado's public postsecondary institutions.

3. System Design Criteria

Design activities and the criteria for general design quality were defined as follows.

a. The database needs to be as stable as possible; changes in structure should not require modifying the applications that use the database.

b. Records contain related data items.

c. Data associations and data usage patterns should not determine the structure in which the data is stored.

d. All records are logical records.

e. The data in a data store record contains no repeating groups.

f. For every file in the cohort system, a student is the prime entity. The entity identifier should be the student's social security number (SSN), or the student's SSN should be a component of the identifier.

g. The key must uniquely identify every record. No data item in the primary key can be discarded without destroying the property of unique identification. In the master file, the student identifier is unique; in all other files, the identifier is part of a concatenated key.

h. Each item in a record is functionally dependent on the whole key of that record.

i. This system is partitioned into individual modules or tasks. The two main modules are database maintenance and database access.

4. File layout and construction.

The files or data stores of the Cohort Tracking System are the key components of the system. They are the output of the database creation module and the input of the data access module. If a record exists in any one of the five files (Degrees Granted, Enrollment, Financial Aid, Undergraduate Applicant-Freshman, Undergraduate Applicant-Transfer), there will be a matching record on the master file. Each master record will match at least one record on the five relational files. The various files were structured to contain a minimal amount of redundant data but all commonly contain the Social Security Number as part of the primary key. All files contain the dates they were created and last updated as control data.

The schema of the six files are defined later in the Detail Design Section.

5. Extract and analysis

The three extract files are defined later in the Detail Design Section. The design criteria for the extract and analysis are:

a. There should be a limited number of pre-defined extract files. Each should be differentiated by scope and degree of detail of the data.

b. The design of the extract files should allow user to assess current data as well as history/trend data for any subset of students.

c. Corresponding code should defined the various elements of each extract file.

In summary, the Cohort system was conceptualized as an integrated student database with admissions standards, enrollment, degrees awarded, and financial aid components. Not predicated on the entering year of the student group nor segmented by type of student (i.e., undergraduate), Cohort covers all students who have applied to a Colorado public postsecondary institution.

Once the preliminary design issues were settled, the project progressed into the detail design stage. The specific problem the Cohort tracking system was designed to address was how to track the academic and non-academic activities that contribute to a student's completing or dropping out of higher education. The distinguishing features of the solution are that Cohort

incorporates both an entry-cohort and exit-cohort methodology and that it is system-based rather than institution-based. System in this context is defined as the Colorado public postsecondary higher education system.

Cohorts are typically identified by the first term of active enrollment at any public institution. A set of fixed data elements, drawn largely from a first-time student's first appearance in the system, comprises the basic demographic and entry cohort description. A set of data elements is recorded for each term the student is enrolled, each term he or she applies for admission, and each year he or she applies for financial aid. All degrees attained are recorded. An optional set of data elements on post-attendance employment is specified, but this set will not be implemented during Cohort's first year.

The file was designed to batch-process the four source files without on-line update capability. Output files were extracted by specifying selection criteria. The anticipated result is a data source that provides both aggregate and linked data for a variety of users. The data is available for immediate analysis.

As design proceeded, the conceptual model translated into a relational database with the following components:

Master File
Enrollment
Financial Aid
Degrees Granted
Undergraduate Applicant File--Freshmen
Undergraduate Applicant File--Transfer

These six relational files have the following common elements:

- All files will have the SSN as the primary key or a component of the primary key.

- All primary keys will be unique; include all data elements required to insure the key will be unique on that file.

- Secondary keys will be non-existent or minimal.

- File activity will be confined to the growth of the file.

- The SURDS files is the source data.

- All data will be corrected and verified before the file is updated. Records will be added on an annual schedule based on the date source data is verified.

The following table describes the schema of the six relational files:

| FILE | PRIMARY KEY | SECONDARY KEY | DATA (Descriptive) | CONTROL DATA |
|---|---|---|---|---|
| MASTER | SSN | None | Demographics + Entry Point Data + Exit Point Data | Date Created Date Updated |
| DEGREES GRANTED | SSN+YEAR+INST+PROGRAM +SEQ+DEGREE LEVEL | None | Same as key | Date Created Date Updated |
| ENROLLMENT | SSN+INST+YEAR+TERM | None | Student Level+Credit Hour + GPA + Program Data | Date Created Date Updated |
| FINANCIAL AID | SSN+INST+YEAR | None | Financial Background + Financial Award Data + Award Summary Data | Date Created Date Updated |
| UNDERGRADUATE APPLICANT: FRESHMAN | SSN+YEAR+TERM | INDEX SCORE | High School Academic Indicators+ Admission & Eligibility Code per Institution | Date Created Date Updated |
| UNDERGRADUATE APPLICANT: TRANSFER | SSN+YEAR+TERM | None | High School Academic Indicators+ Post-secondary Data + Admission & Eligibility Code per Institution | Date Created Date Updated |

The Master File is the only file limited to a single record per student. The student is the basic unit of analysis in this system. While a student may be enrolled for several terms, receive financial aid for several years, apply to multiple institutions, and receive more than one degree, this record maintains the constant descriptors: birth date, sex, ethnicity, state of origin, year of high school graduation. For this reason, the Master File becomes the principal file of the Cohort database. Also included are a limited number of secondary keys that facilitate file extraction and a group of derived elements that are commonly needed in analyses.

Source of data: SURDS Enrollment File; missing demographic data may be obtained from subsequent processing of other files.

Purpose: To describe the student population.

Minority project application:

This file is the only file that carries demographic information on students, so it would be used to extract minority subgroups of students.

The Enrollment File will be the largest of the six files. This file is a history of a student's activity and with the number of terms the student is enrolled and the number of institutions attended.

Source of data: SURDS Enrollment File

Purpose: To track a student's academic performance.

Minority project application:

To measure the rates at which minority students from various ethnic groups are retained in higher education.

Financial Aid File will be a mid-size file, its volume determined by the number of times and number of institutions that a student applies for financial aid.

Source of data: SURDS Financial Aid File

Purpose: To monitor how financial aid affects performance and to track patterns in financial aid recipients.

Minority project application:

To determine whether the availability of aid affects access.

Degrees Granted will be the smallest file both in record size and volume of records. Although a student could appear on this file more than once, one appearance will be typical since this file records a formal exit from Colorado higher education.

Source of data: SURDS Degree Granted File

Purpose: To monitor students' completion of higher education. The key area and the data area are identical on this file since the degree granted determines uniqueness.

Minority project application:

To compare minority and non-minority graduation rates.

Undergraduate Applicant File--Freshmen is an entry-point record. The typical student will only appear in this file once since it records first-time freshmen information: data used to decide admission, the institutions to which the student applied, and the resulting admission decision at each institution.

Source of data: Undergraduate Applicant File.

Purpose: To track a student's performance based on pre-admission indicators (e.g., index).

Minority project application:

To monitor minority students' access to higher education.

Undergraduate Applicant File--Transfer is similar to the Undergraduate Applicant File--Freshman. The file contains postsecondary data in addition to high school data.

Source of data: Undergraduate Applicant File.

Purpose: To track a student's performance based on pre-admission indicators (e.g., transfer GPA).

Minority project application:

To monitor migration patterns within Colorado public higher education and to see whether transfer agreements are providing minority students access to Colorado's four-year institutions.

## V. IMPLEMENTATION

Implementation of the pilot system began in May 1989 and continued until September 1989. The technical implementation of the system dealt with the two primary areas of operations as defined in the system context: processes related to creation and maintenance of the database, processes related to data access and extraction. A major amount of time in each phase was allocated for system testing, allowing staff to interact with the system. As its developers tested the system and users worked with it, some features were changed or added to make the system more productive.

### STEP ONE: Construction of System

In this phase, the database was populated with data from the SURDS files. This required programming eight modules that accepted the input data, defined it, laid out processing instructions, and saved the data in specified formats to the database.

The information used by higher education policy makers must be accurate and timely. But the main consideration must be how the various data elements fit together. For this reason, instructions for validation criteria and data element priorities were provided as well as rules for mapping the input data into the database. The validation criteria were applied before input data was stored. Mapping defined the correspondence between the input data definition and the stored database definition. Most of the data transformation was a simple one-to-one mapping. However, the undergraduate applicant files involved several types of mapping: encoding item values, changing intra-record structures, and applying algorithms to derive new values.

The following tables list the file layouts for the six Cohort files:

| MASTER FILE | | | | | |
|---|---|---|---|---|---|
| | NAME OF FIELD | FIELD LENGTH | TYPE | KEY FIELD | COMMENTS |
| 1 | SSN | 9 | A | Primary | |
| 2 | Current-Inst | 4 | A | Secondary | |
| 3 | Current-Area-of-Study | 2 | A | Secondary | |
| 4 | First-Year-Enrolled | 2 | A | Secondary | |
| 5 | First-Term-Enrolled | 1 | A | Secondary | |
| 6 | Last-Year-Enrolled | 2 | A | Secondary | |
| 7 | Last-Term-Enrolled | 1 | A | Secondary | |
| 8 | Highest-Degree-Awarded | 2 | A | Secondary | |
| 9 | Sex | 1 | A | | |
| 10 | Ethnic | 1 | A | | |
| 11 | Birthdate | 6 | A | | YYMMDD format |
| 12 | State Code | 2 | A | | |
| 13 | County Code | 3 | A | | |
| 14 | Year-HS-Graduated | 2 | A | | |
| 15 | Number-Inst-Enrolled | 1 | N | | |
| 16 | Number-Years-Enrolled | 1 | N | | |
| 17 | First-Institution-Enrolled | 4 | A | | |
| 18 | First-Level-Enrolled | 2 | A | | |
| 19 | First-Program-Enrolled | 6 | A | | |
| 20 | First-Program-Seq-No | 2 | A | | |
| 21 | Last-Level-Enrolled | 2 | A | | |
| 22 | Last-Program-Enrolled | 6 | A | | |
| 23 | Last-Program-Seq-No | 2 | A | | |
| 24 | Income-Category | 1 | A | | |
| 25 | Create-Date | 6 | A | | YYMMDD format |
| 26 | Update-Date | 6 | A | | YYMMDD format |



BEST COPY AVAILABLE

| DEGREES GRANTED FILE | | | | | |
|---|---|---|---|---|---|
| | NAME OF FIELD | FIELD LENGTH | TYPE | KEY FIELD | COMMENTS |
| 1 | SSN | 9 | A | Primary | |
| 2 | YEAR | 2 | N | Primary | |
| 3 | INSTITUTION | 4 | A | Primary | |
| 4 | PROGRAM-ENROLLED | 6 | A | Primary | |
| 5 | PROGRAM-SEQ-NO | 2 | A | Primary | |
| 6 | DEGREE-LEVEL | 2 | A | Primary | |
| 7 | Filler | 5 | A | | |
| 8 | Filler | 38 | A | | |
| 9 | Create-Date | 6 | A | | YYMMDD format |
| 10 | Update-Date | 6 | A | | YYMMDD format |

note: The key and data area are identical in this file.

| ENROLLMENT FILE | | | | | |
|---|---|---|---|---|---|
| | NAME OF FIELD | FIELD LENGTH | TYPE | KEY FIELD | COMMENTS |
| 1 | SSN | 9 | A | Primary | |
| 2 | YEAR | 2 | N | Primary | |
| 3 | TERM | 1 | A | Primary | |
| 4 | INSTITUTION | 4 | A | Primary | |
| 5 | Filler | 8 | A | | |
| 6 | Student Level | 2 | A | | |
| 7 | Program Type | 1 | A | | |
| 8 | Registration Status | 1 | A | | |
| 9 | Tuition | 1 | A | | |
| 10 | Program | 6 | A | | |
| 11 | Program Sequence No. | 2 | A | | |
| 12 | Credit Hr: RI | 3 | N | | |
| 13 | Credit Hr: ESP | 3 | N | | |
| 14 | Credit Hr: Other | 3 | N | | |
| 15 | Total Credit Hr. | 3 | N | | |
| 16 | Cum GPA | 2 | N | | |
| 17 | Second Program | 6 | A | | |
| 18 | Second Program Seq | 2 | A | | |
| 19 | Filler | 7 | A | | |
| 20 | Create-Date | 6 | A | | YYMMDD format |
| 21 | Update-Date | 6 | A | | YYMMDD format |

| FINANCIAL AID FILE | | | | | |
|---|---|---|---|---|---|
| | NAME OF FIELD | FIELD LENGTH | TYPE | KEY FIELD | COMMENTS |
| 1 | SSN | 9 | A | Primary | |
| 2 | INST | 4 | A | Primary | |
| 3 | YEAR | 2 | A | Primary | |
| 4 | Enrollment-Class | 1 | A | | |
| 5 | Legal-Class | 1 | A | | |
| 6 | Student-Level | 2 | A | | |
| 7 | Duration | 2 | N | | |
| 8 | Income | 5 | N | | |
| 9 | Budget-Size | 1 | N | | |
| 10 | Budget-Amount | 5 | N | | |
| 11 | Resources-Family | 5 | N | | Family resources includes student and parent contribution |
| 12 | Resources-Parent | 5 | N | | |
| 13 | Need | 5 | N | | |
| 14 | State-Recipient-Indicator | 1 | A | | |
| 15 | CSIG | 5 | N | | |
| 16 | Colorado-Student-Grant | 5 | N | | |
| 17 | Colorado-Work-Study | 5 | N | | |
| 18 | Undergraduate-Merit | 5 | N | | |
| 19 | Colorado-Graduate-Grant | 5 | N | | |
| 20 | Colorado-Grad-Fellow | 5 | N | | |
| 21 | Colo-Specialty-1 | 5 | N | | |
| 22 | Colo-Specialty-2 | 5 | N | | |
| 23 | Colo-Specialty-3 | 5 | N | | |
| 24 | Colo-Specialty-4 | 5 | N | | |
| 25 | PELL | 5 | N | | |
| 26 | SEOG | 5 | N | | |
| 27 | Federal-Work-Study | 5 | N | | |
| 28 | CTEP | 5 | N | | |
| 29 | NDSL | 5 | N | | |
| 30 | Other-Federal | 5 | N | | |

| FINANCIAL AID FILE | | | | | |
|---|---|---|---|---|---|
| 31 | Institutional-Scholarship | 5 | N | | |
| 32 | Institutional-Employment | 5 | N | | |
| 33 | Institutional-Funds-1 | 5 | N | | |
| 34 | Institutional-Funds-2 | 5 | N | | |
| 35 | Other-Scholarship | 5 | N | | |
| 36 | GSL | 5 | N | | |
| 37 | SLS | 5 | N | | |
| 38 | CASL | 5 | N | | |
| 39 | Loans-Federal | 5 | N | | |
| 40 | Loans-State | 5 | N | | |
| 41 | Total-Grant | 7 | N | | |
| 42 | Total-Merit | 7 | N | | |
| 43 | Total-Work | 7 | N | | |
| 44 | Total-Loan | 7 | N | | |
| 45 | Total-Other | 7 | N | | |
| 46 | Total-Awards | 7 | N | | |
| 47 | Filler | 18 | A | | |
| 48 | Create-Date | 6 | A | | YYMMDD format |
| 49 | Update-Date | 6 | A | | YYMMDD format |

| UNDERGRADUATE APPLICANT: FRESHMAN FILE | | | | | |
|---|---|---|---|---|---|
| | NAME OF FIELD | FIELD LENGTH | TYPE | KEY FIELD | COMMENTS |
| 1 | SSN | 9 | A | Primary | |
| 2 | YEAR | 2 | N | Primary | |
| 3 | TERM | 1 | A | Primary | |
| 4 | Filler | 4 | A | | |
| 5 | Index | 3 | N | Secondary | |
| | Admission Status | | | | The following 13 fields are identical in content but refer to specific institutions. Each of Admission status is composed of two one-digit codes: Admission code and Eligibility code.<br><br>Admission Code indicates whether student was:<br>- applied, not admitted<br>- admitted, not enrolled<br>- enrolled<br><br>Eligibility Code indicates the actual admission decision:<br>- failed the standards<br>- passed the standards<br>- exempt for specific reason |
| 6 | ASC Admission Status | 2 | A | | |
| 7 | CSM Admission Status | 2 | A | | |
| 8 | CSU Admission Status | 2 | A | | |
| 9 | FLC Admission Status | 2 | A | | |
| 10 | MESA Admission Status | 2 | A | | |
| 11 | MSC Admission Status | 2 | A | | |
| 12 | UCB Admission Status | 2 | A | | |
| 13 | UCCS Admission Status | 2 | A | | |
| 14 | UCD Admission Status | 2 | A | | |
| 15 | UCHSC Admission Stat | 2 | A | | |
| 16 | UNC Admission Status | 2 | A | | |
| 17 | USC Admission Status | 2 | A | | |
| 18 | WSC Admission Status | 2 | A | | |
| 19 | ACT: Composite | 2 | N | | |

| UNDERGRADUATE APPLICANT: FRESHMAN FILE | | | | | |
|---|---|---|---|---|---|
| 20 | ACT: Math | 2 | N | | |
| 21 | ACT: English | 2 | N | | |
| 22 | ACT: Natural Science | 2 | N | | |
| 23 | ACT: Social Science | 2 | N | | |
| 24 | SAT: Composite | 4 | N | | |
| 25 | SAT: Verbal | 3 | N | | |
| 26 | SAT: Math | 3 | N | | |
| 27 | High School GPA | 2 | N | | 9V9 |
| 28 | High School Rank | 2 | N | | |
| 29 | GED | 2 | A | | |
| 30 | Filler | 43 | A | | |
| 31 | Create-Date | 6 | A | | YYMMDD format |
| 32 | Update-Date | 6 | A | | YYMMDD format |

| UNDERGRADUATE APPLICANT: TRANSFER FILE | | | | | |
|---|---|---|---|---|---|
| | NAME OF FIELD | FIELD LENGTH | TYPE | KEY FIELD | COMMENTS |
| 1 | SSN | 9 | A | Primary | |
| 2 | YEAR | 2 | N | Primary | |
| 3 | TERM | 1 | A | Primary | |
| 4 | Filler | 4 | A | | |
| 5 | Filler | 3 | A | | |
| | Admission Status | | | | The following 13 fields are identical in content but refer to specific institutions. Each of Admission status is composed of two one-digit codes: Admission code and Eligibility code.<br>Admission Code indicates whether student was:<br>- applied, not admitted<br>- admitted, not enrolled<br>- enrolled<br>Eligibility Code indicates the actual admission decision:<br>- failed the standards<br>- passed the standards<br>- exempt for specific reason |
| 6 | ASC Admission Status | 2 | A | | |
| 7 | CSM Admission Status | 2 | A | | |
| 8 | CSU Admission Status | 2 | A | | |
| 9 | FLC Admission Status | 2 | A | | |
| 10 | MESA Admission Status | 2 | A | | |
| 11 | MSC Admission Status | 2 | A | | |
| 12 | UCB Admission Status | 2 | A | | |
| 13 | UCCS Admission Status | 2 | A | | |
| 14 | UCD Admission Status | 2 | A | | |
| 15 | UCHSC Admission Stat | 2 | A | | |
| 16 | UNC Admission Status | 2 | A | | |
| 17 | USC Admission Status | 2 | A | | |
| 18 | WSC Admission Status | 2 | A | | |
| 19 | ACC Admission Status | 2 | A | | |
| 20 | AIMS Admission Status | 2 | A | | |



BEST COPY AVAILABLE

| UNDERGRADUATE APPLICANT: TRANSFER FILE | | | | | |
|---|---|---|---|---|---|
| 21 | CCA Admission Status | 2 | A | | |
| 22 | CCD Admission Status | 2 | A | | |
| 23 | CMC Admission Status | 2 | A | | |
| 24 | CNCC Admission Status | 2 | A | | |
| 25 | FRCC Admission Status | 2 | A | | |
| 26 | LCC Admission Status | 2 | A | | |
| 27 | MCC Admission Status | 2 | A | | |
| 28 | NJC Admission Status | 2 | A | | |
| 29 | OJC Admission Status | 2 | A | | |
| 30 | PCC Admission Status | 2 | A | | |
| 31 | PPCC Admission Status | 2 | A | | |
| 32 | RRCC Admission Status | 2 | A | | |
| 33 | TSJC Admission Status | 2 | A | | |
| 34 | Program Type | 1 | A | | |
| 35 | Transfer GPA | 2 | N | | 9V9 |
| 36 | Transfer Credit Hours | 3 | N | | |
| 37 | Level Prior to Transfer | | | | |
| 38 | ACT: Composite | 2 | | | |
| 39 | ACT: Math | 2 | | | |
| 40 | ACT: English | 2 | | | |
| 41 | ACT: Natural Science | 2 | | | |
| 42 | ACT: Social Science | 2 | | | |
| 43 | SAT: Composite | 4 | | | |
| 44 | SAT: Verbal | 3 | | | |
| 45 | SAT: Math | 3 | | | |
| 46 | High School GPA | 2 | | | |
| 47 | High School Rank | 2 | | | |
| 48 | GED | 2 | A | | |
| 49 | Transfer Institution Code | 4 | A | | |
| 50 | Filler | 5 | A | | |
| 51 | Create-Date | 6 | A | | YYMMDD format |
| 52 | Update-Date | 6 | A | | YYMMDD format |

STEP TWO: Integrity Control

Quality control, security, privacy, and recovery were issues of implementation as well as of design. Since there is a direct correlation between the quality of data in a system and user confidence, a primary consideration was maintaining the quality of Cohort data. It needs to be as accurate, current, and complete as possible. To control accuracy, stored data was validated against the source data. The controls included: exception printouts of the records that failed to pass the validation criteria; statistical summary reports of records processed, updated, added, or deleted; suspense files of records that could not be processed; and checks for reasonableness and consistency. The system performs validations automatically.

The level of security protection impacts the updating function. Because CCHE time-shared on a mainframe system that had few protection features, certain protection features had to be built into the system itself. Only five designated users could access the Cohort tracking system; the Cohort system was invisible to all other persons accessing this computer. The access path was through the main TSO menu, that called a customized Cohort menu. The Cohort menu listed four functions. Update and file maintenance authorization was limited to the database administrator through user name and password and disabled for all other CCHE users. With only one person authorized to update the database, all updates are performed in isolation.

The data on the master file is vulnerable to field overwrite, since field updates sometimes supply data that is more complete than the original database records and since continuing activity modifies some fields. Data

mapping and validation were therefore predicated on the sequencing procedures determined during the design phase. Update synchronization supplies a further control. Updates to the master file record are date-driven. The time stamp on the master file record permits the rejection of a field update that does not follow the sequencing pattern.

Automatic recovery and backup procedures were built into the updating process. Three generations of backup are maintained, and a copy of the most recent backup tape is maintained off-site.

STEP THREE: Systems Testing

The purpose of systems testing was to determine the accuracy of the data during loading and updating. The methods used included program walk-through, top-down incremental implementation, application documentation, and validity table checks.

STEP FOUR: Modification of the Design of Extract Files.

Design specifications were modified to reflect variations from the original design and to take advantage of enhancements developed during the creation of the database. Acceptance criteria were generated.

STEP FIVE: Development of Extract Environment and Processing

At this stage decisions were made about the number and types of extract files Cohort would provide, the ways to select subgroups of students, the

constraints on selection imposed by considerations of system integrity, and the format of the menus would provide an access channel to the extract files. Three distinct file layouts were defined: a longitudinal enrollment extract file (seven years), a longitudinal financial aid file (seven years), and a single-year detail extract. The enrollment extract file became the top priority since the first use of the Cohort system was to develop a retention model of minority students. The enrollment extract file was provided to external consultants for testing. The output were the modules that provides for the inquiry and retrieval from the database.

The layout of snapshot file is similar to the two other variations. The Longitudinal Financial Aid file in addition contains seven years of detail information for individual awards (e.g. PELL, etc). The Longitudinal Enrollment Data includes seven years of enrollment data but only indicates if the student received Financial Aid and the total award amount for each year. The size of the two longitudinal file is considerable and since the information needs dictated the format.

| | ONE YEAR SNAPSHOT FILE | | |
|---|---|---|---|
| | FIELD NAME | SOURCE FILE | COMMENTS |
| 1 | SSN | Master | |
| 2 | Sex | Master | |
| 3 | Ethnic | Master | |
| 4 | Birthdate | Master | |
| 5 | Year of HS Graduation | Master | |
| 6 | State | Master | |
| 7 | County | Master | |
| 8 | First Year Enrolled | Master | |
| | FALL TERM DATA | | |
| 9 | Institution | Enrollment | |
| 10 | Student Level | Enrollment | |
| 11 | Tuition | Enrollment | |
| 12 | Program Code | Enrollment | |
| 13 | Registration Status | Enrollment | |
| 14 | Credit Hours RI | Enrollment | |
| 15 | Credit Hours ESP | Enrollment | |
| 16 | Credit Hours Other | Enrollment | |
| 17 | Credit Hours Total | Enrollment | |
| 18 | GPA | Enrollment | |
| 19 | Program Type | Enrollment | |
| | SPRING TERM DATA | | |
| 20 | Institution | Enrollment | |
| 21 | Student Level | Enrollment | |
| 22 | Tuition | Enrollment | |
| 23 | Registration Status | Enrollment | |
| 24 | Credit Hours RI | Enrollment | |
| 25 | Credit Hours ESP | Enrollment | |
| 26 | Credit Hours Other | Enrollment | |
| 27 | Credit Hours Total | Enrollment | |
| 28 | GPA | Enrollment | |
| 29 | Program Type | Enrollment | |

| | ONE YEAR SNAPSHOT FILE | | |
|---|---|---|---|
| | FIELD NAME | SOURCE FILE | COMMENTS |
| | FINANCIAL AID DATA | | Total of Aid Received in Summer, Fall, Spring semesters |
| 30 | Enrollment Class | Financial Aid | |
| 31 | Legal Class | Financial Aid | |
| 32 | Duration | Financial Aid | |
| 33 | Income | Financial Aid | |
| 34 | Need | Financial Aid | |
| 35 | Total Grant Dollars Awarded | Financial Aid | |
| 36 | Total Merit Dollars Awarded | Financial Aid | |
| 37 | Total Work Study Awarded | Financial Aid | |
| 38 | Total Loan Awarded | Financial Aid | |
| 39 | Total Other Dollars Awarded | Financial Aid | |
| | DEGREE DATA | | Occurs twice, to record multiple degrees |
| 40 | Institution That Awarded Degree | Degree | |
| 41 | Year Degree Awarded | Degree | |
| 42 | Degree Level | Degree | |
| 43 | Program Code of Degree | Degree | |
| | FRESHMAN APPLICANT DATA | | Occurs 13 times: once for each four-year institution |
| 44 | Applicant Status | UAF: Freshman | |
| 45 | Eligibility Status | UAF: Freshman | |
| | HIGH SCHOOL ACADEMIC DATA | | |
| 46 | Index Score | UAF: Freshman | |
| 47 | HS GPA | UAF: Freshman | |
| 48 | HS Rank | UAF: Freshman | |
| 49 | ACT Score | UAF: Freshman | |
| 50 | SAT Score | UAF: Freshman | |

| | ONE YEAR SNAPSHOT FILE | | |
|---|---|---|---|
| | FIELD NAME | SOURCE FILE | COMMENTS |
| 51 | GED Score | UAF: Freshman | |
| | TRANSFER DATA | | Occurs 28 times, once for each public institution |
| 52 | Applicant Status | UAF: Transfer | |
| 53 | Eligibility Status | UAF: Transfer | |

STEP SIX: Comprehensive Review

As the technical and functional aspects of the system were tested and the system was prepared for final acceptance by CCHE, the CCHE data administrator was heavily involved in insuring that the Cohort system would be compatible with the CCHE processing environment.

One of the advantages of overlapping the development of the system with the retention analysis was that the system was immediately used by an outside group whose expectations were not prejudiced by involvement in the design of the database. Recommendations from these end users allowed the consultant to fine-tune the extract processing as he developed the other extract files and improved selection processing. For example, only one occurrence of tuition status was included in the database originally. But interest in the number of undergraduate students that were reclassified from non-resident to resident status identified a need to include this field on the enrollment file, not part of the master file.

An evaluation of the Cohort Tracking System after the first year of use was an important activity. This was conducted by CCHE's I&R staff and the consultants who developed the retention measures. The evaluation would measure the effectiveness of the system against the initial design criteria and user expectations.

STEP SEVEN: System Documentation

Cohort software has been documented with systems documentation, design documentation, and user guides. The systems documentation provides background information on the initiation, development, and operational phases of the system, including functional specifications, design specifications, development procedures, test plans, and system controls. It serves as a design guide for programming, as a historical reference for user guides, as a project management tool, and as a guide for maintenance of the system. Its primary user is the database administrator. Design documentation is the bridge between the technical documentation and the user guides. It provides specific information on program input and output, processing hierarchy (charts and narrative), data editing specifications and ranges, and datelines of program modifications. The user guides train users to use the programs and provide on-line references for more efficient program use.

# APPENDIX B

## DEVELOPMENT OF MINORITY RETENTION MEASURES

CONTENTS


INTRODUCTION . . . . . 1

MEASURES OF MINORITY RETENTION AT COLORADO'S FOUR-YEAR COLLEGES AND UNIVERSITIES . . . . . 3
- Within-School Retention . . . . . 5
- Within-School Progress . . . . . 7
- Transfers . . . . . 9
- Within-System Retention . . . . . 11
- Indices of Within-School and Within-System Retention Measures . 12
- Summary of Measures for the Four-Year Cohort . . . . . 14
- Caveats . . . . . 16

MEASURES OF MINORITY RETENTION AT COLORADO'S COMMUNITY COLLEGES . . . . . 17
- The Community College Cohort . . . . . 18
- Ethnic Composition, Program Type, and Enrollment Status . . . . . 19
- Measuring Positive Outcomes . . . . . 20
  - Transfer to a Four-Year School
  - Degree Completion
  - Continued Enrollment in a Two-Year School
  - Any Positive Outcome
- Ethnic Group Differences in Success Rates . . . . . 24
- Differences in Transfer Rate by School . . . . . 25
- Summary Measures for the Community College Cohort . . . . . 26
- Caveats . . . . . 28

CONCLUSION . . . . . 29

TABLES


Table 1 . . . . . 31
Listing of Four-Year Colleges

Table 2 . . . . . 32
Freshmen Cohort 1986, Four-Year Institutions
Ethnic Breakdown by Percentage

Table 3 . . . . . 33
Enrollment Patterns at Four-Year Schools of Origin
by Ethnicity and Institution

Table 4 . . . . . 33
Within-School Retention Percentage
of Four-Year Cohort Enrolled All Three Years

Table 5 . . . . . 34
Ethnic and Institutional Differences in Progression
for Four-Year Cohort

Table 6 . . . . . 34
Progress of Four-Year Cohort Toward a Four-Year Degree

Table 7 . . . . . 35
Percentage of Four-Year Cohort Attending
a Different Colorado School in Year 3

Table 8 . . . . . 35
Where Transfers from the Four-Year Cohort Go
Based on Year 3 Enrollment

Table 9 . . . . . 36
Within-System Enrollment
of Four-Year Cohort
at Any Public Institution in Colorado

TABLES (Continued)

Table 10 . . . . . 37
Indices Summarizing Within-System
and Within-School Retention
for the Four-Year Cohort

Table 11 . . . . . 39
Summary of Index Measures for the Four-Year Cohort

Table 12 . . . . . 41
Colorado Community Colleges

Table 13 . . . . . 42
Initial Community College Cohort
by Institution, Program Type, and Enrollment Status

Table 14 . . . . . 45
Ethnic Composition of Community College Cohort

Table 15 . . . . . 46
Enrollment Status and Program Type by Ethnic Group
for the Community College Cohort

Table 16 . . . . . 46
Enrollment Status by Program Type by Ethnic Group
for the Community College Cohort

Table 17 . . . . . 47
Outcome by Program Type and Enrollment Status
for the Community College Cohort

Table 18 . . . . . 48
Receipt of Degree or Certificate in 1987 or 1988
from School of Origin
for the Community College Cohort

TABLES (Continued)

Table 19 . . . . . 49
Success Rates for the Community College Cohort

Table 20 . . . . . 49
Percentage of Community College Cohort
Transferring to a Four-Year School

Table 21 . . . . . 50
Detailed Outcomes for the Community College Cohort
by Ethnicity and School

Table 22 . . . . . 53
Summary Table: Comparison of Outcomes for
Community College Cohort across Schools

## INTRODUCTION

Before Colorado can improve the rates at which minority students graduate from its public colleges and universities, the Colorado Commission on Higher Education and education policy makers need a better sense of how minority students are faring in higher education. This report, which analyzes statistical data produced by a new system for tracking students, is preliminary only; the data analyzed covers only three years, and the techniques for assessing it continue to be refined. But even such a preliminary analysis should prove useful, for it begins to give educators and policy makers a sense of where the challenges lie.

The primary goal of this study is to develop measures that can be used to identify schools where minorities fare either well or poorly. Thereafter, the Commission will review what goes on at these schools that could explain differences in outcomes. The measures developed here also provide a baseline against which progress can be assessed.

The Cohort Tracking System (CTS) database used in the analysis includes the information on admissions, enrollments, financial aid, and degree receipt supplied by Colorado's "Student Unit-Record Data System" (SURDS), which covers all Colorado institutions of public higher education. The particular strength of the cohort system is that it allows the tracking of students over time and across institutions. Even though completing a baccalaureate degree generally takes a minimum of four years and often as long as six years, the CTS data available for analysis covered fall enrollment data for only three years--1986, 1987, and 1988. So this report, which describes what happened over those three years to the first-time students who entered the state's public postsecondary education system

in the fall of 1986, emphasizes retention, progress, and transfer rather than degree completion. Once additional years of data are available, subsequent reports will extend the analysis.

Because the statistics reported here are preliminary, conclusions drawn about the relative performance of institutions should not be considered definitive. As further years of data become available, the Commission will analyze full-time/part-time enrollments and other factors that are relevant to a complete and accurate picture of the progress of minority students. That is, the measures developed in this study appear to be useful, but additional factors need to be considered before strong conclusions can be drawn.

This report has two major parts. The first part describes patterns of student enrollment and progress at Colorado's four-year colleges and universities. The second part, which focuses on community colleges, describes patterns of enrollment, degree completion, and rates of transfer to four-year institutions. The report concludes with a summary of measures computed in the study.

The preparation of this report is part of a project funded by the Ford Foundation through a grant from the State Higher Education Executive Officers (SHEEO). The Cohort Tracking System was also developed with funding from the Ford/SHEEO grant. Most of the analysis was performed by consultants to the Colorado Commission on Higher Education: Peggy Cuciti and Laura Applebaum, from the Center for Public Policy Research at the Graduate School for Public Administration, University of Colorado at Denver. Additional writing and analysis was carried out by the CCHE staff. Earlier versions of this report were reviewed

by the Commission's Data Advisory Group, a committee of institutional and governing board researchers.

## MEASURES OF MINORITY RETENTION AT COLORADO'S FOUR-YEAR COLLEGES AND UNIVERSITIES

How does minority retention compare to the retention of non-Hispanic whites? This part of the report develops some measures of retention and progression patterns that can be used to provide some preliminary answers to this important question.

The data used was the cohort of degree-seeking, first-time freshmen entering the state's four-year college and university programs in fall 1986. Most of the analysis is based on data from 11 of the state's 12 four-year schools (see Table 1). The freshmen cohort is divided into five ethnic groupings: non-Hispanic whites, Asians, blacks, American Indians, and Hispanics. Non-resident aliens and students with unreported ethnicity were excluded from this analysis. Whites, who are very much in the majority, make up 86.9% of the fall 1986 entering cohort (see Table 2). Although Hispanics are the second-largest group, they comprise only 6.6% of the cohort. Asians, blacks, and Indians account for 3.2%, 2.2%, and 1.1% of the cohort respectively.

The state's four-year schools differ not only in overall size but also in the percentage of degree-seeking, first-time freshmen who are members of ethnic minorities. Many of the schools have very few minority students. Since analyses based on small numbers are prone to error and because of confidentiality

requirements, data is not reported for individual ethnic groups within institutions if there are fewer than ten students in the cohort. Cohort sizes are shown in Table 2.

In the pages that follow, several retention measures are calculated. First, "within-school" retention is examined--that is, the retention of students at the institution in which they initially enroll. Second, the within-school data is examined for progress, to see whether the students who remain enrolled progress at the same rate. Third, data that tracks students across institutions (as long as they remain enrolled in public institutions in Colorado) is used to look at student transfers within the system. Retention within the overall system is then compared to retention within schools. A final section summarizes all the retention measures calculated for the four-year college and university system.

The above measures are reported, in Tables 3 through 11, for the public colleges and universities in Colorado, both to illustrate the measures and to provide a preliminary analysis of the relative retention of minorities relative to whites[1]. The focus of the report, however, is on the measures. The Commission is continuing work in this area and will have more definitive analyses of retention available in spring, 1991.

---

[1]Data for Asians is reported in most tables but is not frequently referred to in the text. This is because the Ford/SHEEO grant was specifically targeted at blacks, American Indians, and Hispanics. The Commission, however, in its other affirmative action activities treats Asians as a minority group and will include them more explicitly in future analyses.

Within-School Retention

The data on enrollments for 1986, 1987, and 1988 is based on fall-term enrollments only; data on spring and summer enrollments was unavailable at the time of this study. The measures that can be calculated are therefore imperfect: students who did not enroll in the fall are assumed not to have enrolled all year, and all students who enrolled in the fall are treated as if they were enrolled all year.[1]

A little more than half (53.0%) of the freshmen cohort were enrolled at their "school of origin" (the school in which they started degree programs) in all three fall terms. Approximately one-quarter (27.8%) appear to have left during or after their first year. The rest were enrolled for two years. Of the 19.2% of the entering cohort enrolled two years, 16.1% were enrolled during years one and two and 3.1% during years one and three (see Table 3).

Calculating "return rates" is another way to characterize the data for students who enrolled two years. Approximately 10% of the students who left during or after the first year (that is, who were not enrolled in year 2) returned in year 3. Return rates by ethnic group and institution are reported in the last column of Table 3. Indians and Hispanics were somewhat less likely to re-enroll than other ethnic groups.

---

[1]The Commission has expanded the collection of the SURDS enrollment data to include summer and spring enrollments; spring 1990 is the first reporting year for this additional data.

The overall within-school retention rate for all three years was 53 percent. The rate differs, however, among ethnic groups. The retention rates for Indians, blacks, and Hispanics are lower than the rates for whites and Asians (Table 3). Indians have the lowest retention rate: only 27.4% were enrolled all three years, and fully 58.5% left during or after the first year. Black retention rates are also low: only 36.4% were enrolled all three years. Asians have the highest retention rate: 58.1 percent.

Within-school retention rates also differ by school (see Table 3). They range from a high of 66.4% to a low of 34.1%. The schools with the highest rates are the research universities, which have a predominately full-time, traditional student body. Conversely, the institutions with lower rates have larger numbers of part-time students and also have an older student body. The retention rates also appear to be strongly related to the admission standards of the institutions. Additional analyses might show less variability if, for example, the cohort was restricted to full-time, traditional students with similar high school performance characteristics.

This additional analysis was not done during this study, due to both a lack of time and the already small minority cohort sizes. Future studies will include some of these additional factors. The data in Table 4 does show, however, that many of the factors that influence retention affect all students on a campus. Hence, minorities starting in schools with higher overall retention rates are somewhat more likely to stay enrolled than their counterparts in schools with lower overall retention rates. For example, 52% of blacks starting at UCB, the school with the highest overall within-school retention, were enrolled for three years, whereas the average for all blacks enrolled in Colorado schools was 36.4 percent. Indians and

Hispanics at UCB were also more likely to stay enrolled than their counterparts at other institutions.

While some factors influence within-school retention rates for all groups on a campus, other factors seem to work differentially. On every campus, black and Indian students are less likely to stay enrolled than white students. The retention rates of Hispanics are generally higher than those of blacks and Indians. On most of the campuses, however, their retention rates are lower than the rates of their white counterparts. There are exceptions: Hispanic students in the entering cohort at FLC, WSC, Mesa, and CU Denver are more likely to continue enrollment for three years than non-Hispanic white students.

Within-School Progress

Baccalaureate programs have traditionally been viewed as four-year programs, although national data show that many students, especially minorities, take longer than four years to complete their degrees. In the long run, CCHE's longitudinal database will be used to assess success rates in completing degrees in four, five, and six years. In the short run, one approach to measuring progress toward achievement of a degree is to determine the percent of students enrolled in each year who were "on track" to a four-year degree.

To see how many four-year cohort students in Colorado were on track, the percentage of students enrolled in year 2 who had completed enough credit hours to have sophomore or higher status was determined, as was the percentage of students enrolled all three years who were juniors or seniors. (Of course, failure

to progress does not mean that students have failed courses; they may have been enrolled part-time or they may not have enrolled at all during spring semester.) The data show that 59.9% of all the students enrolled in year 2 were classified as sophomores or better, and 57.4% of those enrolled for all three years were classified as juniors or better (see Table 5).

On average, minority students progressed at a slower pace than white students. Nearly two-thirds (61.5%) of the whites enrolled in year 2 were sophomores, compared to only 33.3% of enrolled blacks, 45.1% of Indians, and 46.5% of Hispanics. The pattern is similar in year 3. One curious development is revealed by the data: though Indians have a much lower retention rate than blacks, Indian students who remain in school apparently progress at a more rapid pace than black students.

Rates of progress vary dramatically by school. For example, at Mesa, the great majority of students still enrolled in year 2 were progressing at a pace that would get them degrees in four years (91.2%). At the other extreme, only 27.6% of students enrolled in year 2 at UCCS had achieved at least sophomore status. These variations are, undoubtedly, at least partially explained by differences in the full-time status of students across institutions.

At every institution, blacks and Hispanics seem likely to progress at a slower pace than whites. Table 6 displays progression percentages by institution and ethnicity, and also calculates an index that shows the progression percentages for minorities relative to whites. The rate at which black and white students progress is most nearly even at MSC. For Hispanics, the differences in year 2 are smallest at FLC,

MSC, and USC. By year 3, the differences are smallest at UNC, MSC, USC, and FLC.

Transfers

Students who do not enroll in their schools of origin in years 2 and 3 may have failed classes, lost interest, or never intended to get a degree. They may, however, have transferred (out of choice or necessity) to a different school. If students transfer to another school in the Colorado system of public higher education, their continuing enrollment is recorded in the Cohort Tracking System database. If, however, a student transfers to an out-of-state school or to a private school, the tracking system cannot, unfortunately, distinguish that type of transfer from "dropping out."

One-third of the students who were not enrolled at their school of origin in the second year had enrolled at another Colorado school. That is, almost 9% of the entering cohort enrolled at a different school in year 2. A similar pattern holds in year 3: 25% of the students not enrolled in their original school had transferred to another Colorado school--about 11% of the entering cohort. Many (but not all) of these students were reported as having transferred in year 2.

A relatively similar percentage of each ethnic group seems to transfer from their original school. Table 7 summarizes transfer data for the cohort still enrolled in year three. For example, 11.3% of whites in year 3 have transferred, which represents about 26.4% of those who appeared to have dropped out based on the

analysis of within-school enrollment. Similarly, 18.9% of black, 10.4% of Hispanic, and 7.5% of Indian non-enrollees were attending another school.

Rates of transfer also vary by school (see Table 7). FLC has the highest rate: 21% of its entering cohort had transferred by the third year after initial enrollment. Other schools with high transfer rates include UCD, UNC, and WSC. UCB is at the opposite extreme: only 4.3% of its students transferred.

Indian students are considerably less likely to transfer than white students in the same school of origin. For example, at FLC (which has the largest cohort of Indian students), only 4.1% of the Indian students in the starting cohort had transferred in year 3, contrasted with 22.6% of the white students in the cohort. For black and Hispanic students, transfer patterns are more varied. At four schools (ASC, UNC, CSU and MSC), blacks are less likely to transfer than whites, but at UCB and USC they are more likely to transfer. Hispanics at UCD, WSC, and MSC are considerably less likely to transfer than whites, but they are more likely to transfer at CSU and UNC.

Whether a low rate of transfer is more desirable than a high rate is difficult to judge. All that can be determined from the data available are patterns of transfer, not information about specific programs or articulation agreements. To elucidate those patterns, whatever their significance, schools were divided into tiers based on CCHE admission standards. In the first tier are UCB and CSU[1], which have the highest entrance standards. Schools in the middle tier at the time of this study include UCD, UCCS, and UNC; the remaining four-year schools make up the

[1]CSM is also in the high tier, and starting with the summer 1990 class, UCD will be in the high tier.

third tier, and all state community colleges are in the fourth tier. Patterns of movement among schools are shown in Table 8.

Slightly more than one-third of all transfers are to UCB or CSU, the schools in the high tier. Hispanics and Asians are slightly less likely than blacks and white to transfer to these schools. Over half the transfers from UCCS, UCD, and USC are to these two schools.

About one-fifth of all transfers are to two-year schools. Blacks (25.8%) and Asians (26.8%) are more likely than members of other ethnic groups to make such transfers. Institutions where an above-average percentage of transfers are to two-year institutions include MSC (35.8%), UNC (28.3%), USC (21.5%), and UCCS (20.5%).

Within-System Retention

As the analysis of transfers indicates, more students stay in school than an analysis of continuing enrollment in schools of origin can indicate. A look at retention within the system completes the picture. Within-system retention counts enrollment at any school in the Colorado system in each of the three observation periods (fall 1986, fall 1987, and fall 1988).

Systemwide patterns of within-system enrollment are reported in Table 9. Not surprisingly, the percentage of students who drop out after year 1 is lower--18.5% as opposed to 27.8% (see Table 3 for comparison). The percentage of students who are continuously enrolled is higher--62.7% as opposed to 53.0%. Also

reported in Table 9 are within-system retention rates by school. A student is assigned to the school of origin whether or not all enrollments occur at that school.

Indices of Within-School and Within-System Retention Measures

Table 10 compares within-system and within-school retention of students enrolled all three years. Two basic indices facilitate institutional comparisons. The first shows how the retention rate for any given ethnic group at a school compares to the overall retention rate for that same group. It is calculated by dividing the school retention rate by the student average rate. For example, the within-school retention rate for blacks at ASC (10.0%) is divided by the overall black rate (36.4%), resulting in an index score of "0.27". A score of 1.00 indicates that retention rates are equal. A score below 1.00 means that members of that ethnic group who first enrolled in that school are less likely to stay enrolled than the statewide average for that group.

The second index highlights differences in the rates between minority and white students who started out in the same school. This index is calculated by dividing the retention rate for a minority group starting at a school by the rate for whites starting at the same school[1]. For example, the within-school retention rate for blacks at CSU (49.0%) is divided by the rate for whites at CSU (63.8%), resulting in an index score of "0.77". A score of 1.00 indicates that retention rates are equal. A score below 1.00 means that minorities who first enrolled in that school are less likely to stay enrolled than whites.

---

[1]A similar index is calculated in Table 6, showing the progression rates of minorities relative to whites at the same schools.

These indices are computed in Table 10 for both within-school and within-system retention. They can be used to compare the performance of ethnic groups across institutions, relative to whites at the original institution, and between the within-school and within-system measures. For example, black students who started school at UCB, UNC, and CSU were the black students most likely to stay in school somewhere within the system. These same schools also had the highest rates in the within-school analysis, but their performance is less exceptional in the within-system analysis. There seems to be some convergence among schools in performance when all enrollments are counted. This is because a smaller percentage of those not enrolled at the high-retention schools were actually enrolled elsewhere in Colorado publics. Even from the systemwide perspective, the rates of black retention are lower than the rates of white retention. That is, at many schools, the index is less than one. For several schools, however, the gap is smaller in the within-system analysis than in the within-school analysis.

Similarly, the table shows that the Hispanic students who started school at UCB, UNC, and CSU--like the black students who started school at those institutions--were most likely to remain in college somewhere in Colorado. On the measure of within-system retention, Hispanics do less well than whites at every institution. This paints a different picture than the within-school analysis, which showed that at several schools (FLC, UCD, USC, and WSC) the percentage of Hispanic students who stayed enrolled was equal to or greater than the percentage of white students.

As indicated earlier, it is difficult to know how to interpret transfers-- should the school of origin be credited with helping a student move on to a program that is

better or more appropriate? In some instances, probably. In other instances, though, a transfer may represent failure to provide a supportive environment.

Summary of Measures for the Four-Year Cohort

The indices were developed as a means of summarizing data and to help identify schools where minorities were doing relatively better with respect to retention. However, each of the measures discussed points to a somewhat different set of schools: schools in which minorities appear to do well by one measure do not always do well on other measures, and a school's performance sometimes depends on the ethnic group involved. To help identify exemplary programs, a summary measure was developed (see Table 11) that combines the four measures from Table 10:

1. Within-school retention rate (i.e., percent enrolled all three years at school of origin) expressed relative to the retention rate for all students of the same ethnicity.

2. Within-school retention rate expressed relative to the retention rate for whites at the same school.

3. Within-system retention rate (i.e., percent enrolled all three years anywhere in the Colorado system of higher education) expressed relative to the retention rate for all students of the same ethnicity.

4. Within-system retention rate expressed relative to the retention rate for whites at the same school.

The four components were weighted differentially. A double weight was placed on retention rates relative to whites at the same school.

Table 11 also includes the progress index from Table 6. There is no clear relationship, however, between the progress index and the retention indices.

The following lists the institutions that seem to do the best, for each ethnic group:

Blacks: The best programs for blacks appear to be at UNC, UCB, and CSU. The figures for Adams State and Metro are lower.

Indians: Only three schools have an Indian cohort large enough to analyze. The statistics for UCB seem best.

Hispanics: The schools with the highest scores are FLC and WSC. It is important to note that there is much less variation among schools in how their Hispanic students perform than there is for the other ethnic minorities.

Asians: Five out of the seven schools in this group have a summary score of 1.00 or higher, but MSC and UCD do particularly well.

Whites: There is less variation in the summary scores for whites than for any other group. The variation on Index 1 and Index 3 is fairly consistent. UCB and CSU have the highest summary scores.

## Caveats

Although the composite picture presented in Table 11 is both interesting and informative in many respects, this table, and indeed this entire analysis, must be seen as only the first step in studying retention at public four-year colleges and universities in Colorado. In general, statistics tell only part of the story. They produce information about patterns of transfer, for example, but they cannot answer the question of why a given student decides to transfer. To that caveat, another must be added: the data available for this report covered only a limited period of time, and only some variables were examined. As use of the Cohort Tracking System continues, the measures must be expanded to calculate graduation rates and the effect of such variables as full-time/part-time status, residency, sex, and the academic ability of the students must be examined. These further analyses should cast further light on the status of minorities in Colorado higher education.

## MEASURES OF MINORITY RETENTION AT COLORADO'S COMMUNITY COLLEGES

The primary interest in this study is the pursuit of baccalaureate degrees by minority students. A decision was made to include community colleges on the presumption that (1) they are a major point of access to higher education for minority students, and (2) increasing the number of minorities receiving baccalaureate degrees will require clearer articulation between community college programs and four-year programs.

In many community colleges, however, students are often in vocational programs or take courses primarily for personal or career development. They may have little interest in earning a degree or certificate, and only a small percentage may intend to transfer to a four-year school. This means that there are limits to the usefulness of the analysis that follows. Transfer to a four-year program, receipt of a degree or certificate, and continued enrollment in a two-year college seem, on the face of it, to be desirable outcomes for community college students. They are outcomes that can be studied through data supplied by the Cohort Tracking System, and they are the ones analyzed in the following pages. It is unclear, however, whether negative judgements should be made about community college programming if large numbers of students do not receive degrees or do not transfer to a four-year school.

The Community College Cohort

There are fifteen public community colleges in Colorado (see Table 12). Eleven of these are part of the Colorado Community College and Occupational Education System (CCCOES) and four are locally supported[1]. In addition, Adams State College and Mesa State College offer two-year degree programs.

For purposes of this analysis, the following entering cohort was identified: students enrolling for the first time in fall 1986 at a public institution offering two-year programs. The full cohort comprises 13,829 students (see Table 13), which is slightly larger than the entering cohort in the fall 1986 four-year cohort. The community colleges cohort varied widely in size across institutions, from a high Colorado Mountain College (2,813 students), to a low at Adams State College (119 students).

Some community colleges emphasize the traditional two-year academic program leading to the AA/AS/AGS degrees while others emphasize vocational training. Schools in which at least 70% of the students were enrolled in a two-year program include PPCC[2] (100%), MCC (79%), Aims (75%), and ACC (73%). Schools in which at least 70% of the cohort enrolled in vocational programs include LCC (74%) and OJC (70%). Colorado Mountain College falls outside the standard classification: 75% of its students were classified as "other" on the program type variable.

---

[1]Unfortunately, data for one of the local district colleges, Northeastern Junior College, is missing from the database. That school's data tape was accidentally destroyed before the longitudinal database could be created by CCHE.

[2]It is likely that there is a data reporting error on the PPCC data.

A little less than one-third of the cohort enrolled for at least twelve credit hours (the definition of full-time student used in this study). Of the remaining part-time students, 24% are shown in the data base as enrolled for no credit hours. Most of these students are at Colorado Mountain College. Since interpreting "0" credit hours is difficult, as is understanding what it means to be in a program that is neither vocational nor two-year, the 2,533 students with these characteristics were eliminated from this analysis. Ethnic identification is missing for almost 15% of the community college cohort, and non-resident aliens comprise another 2%. This led to the elimination of another 2,009 students, resulting in a final cohort size of 9,287.

Ethnic Composition, Program Type, and Enrollment Status

The final cohort sizes at each institution, by ethnicity, are shown in Table 14. Non-Hispanic whites make up 79.9% of the total cohort. This contrasts with 86.9% for the four-year institution cohort. The representation of other ethnic groups in the community college cohort is Hispanics 12.9%, blacks 3.7%, Indians 1.2%, and Asians 2.3%.

Schools differ considerably in ethnic composition. More than one-fifth of the student cohort is Hispanic at TSJC (43%), ASC (33%), OJC (31%), CCD (27%), and PCC (23%). None of the schools has a large black cohort, and blacks constitute 5% of the student cohort at only three schools: CCA (12%), CCD (10%), and PPCC (6%). Indians are also a small percentage of the cohort on all campuses. The largest Indian representation is at PCC (3.4%), CCA (2.5%), and

CCD (1.8%). Non-Hispanic whites are a majority at every campus. Their share of enrollment is lowest at TSJC (53%), CCD (53%), and ASC (61%).

Blacks, Indians, and whites make up a larger share of two-year program enrollments than of vocational program enrollments. The reverse is true for Hispanics and Asians (see Table 14). Table 15 approaches the same information in a different way. It shows that 60% or more of blacks, Indians, and whites are enrolled in two-year programs; for Hispanics the equivalent percentage is 47%, for Asians, 56%. There are also ethnic differences between full-time and part-time students. Asians (49%), blacks (43%), and Hispanics (43%) are more likely to be going to school full-time than Indians (28%) or whites (38%).

Part-time enrollment is more common than full-time enrollment in both vocational and two-year programs (see Table 16). For every ethnic group except blacks, students in vocational programs are more likely to be enrolled full-time than students in two-year programs. For example, 48% of Hispanics in vocational programs started as full-time students, whereas only 38% of those enrolled in two-year programs started full-time. But for blacks, two-year students were more often full-time (46%) than vocational program students (40% full-time).

Measuring Positive Outcomes

The positive outcomes described above were defined more specifically in these terms:

1. Transfer to a four-year school;

2. Receipt of a certificate or degree from school of origin; and/or

3. Continued pursuit of a degree at any community college as measured by enrollment in the fall semester of the third year.

It is important to note that these outcomes are not mutually exclusive. Students may have received a degree from their school of origin and have transferred to a four-year school. Much of the analysis which follows is based on a summary measure that simply identifies the proportion of the students with any of these positive outcomes during the three years for which there is data. For simplicity's sake this measure is labelled the "success rate."

In these terms, the success rate for the community college cohort is about one-third (32%). Table 17 reports the range of positive outcomes by program type, enrollment status, school, and ethnicity.

Transfer to a Four-Year School. Almost 10% of the entire cohort transferred to a four-year school--the vast majority without having received a degree or certificate from their school of origin. Transfers are reported in columns 4 and 5 of Table 17. Students enrolled in two-year programs were twice as likely to transfer to four-year institutions as students enrolled in vocational programs (12.2% vs. 6.3%). Students enrolled full-time were more than twice as likely to transfer as those enrolled part-time (14.6% vs. 6.9%). White students were twice as likely to transfer (10.8%) as black or Hispanic students (5.2% and 5.1% respectively). Indians and Asians were almost as likely to transfer as whites (8.0% and 9.8%, respectively).

The likelihood that students would transfer to a four-year public institution differed quite a bit by school. Aims had by far the highest transfer rate--29.3%. Other schools with a transfer rate of 10% or higher were ACC (10.1%), LCC (10.1%), MCC (11.6%), OJC (10.2%), CMC (13.4%), and CNCC (15.2%).

Degree Completion. Statewide, about 5.6% of the students in the community college cohort received a degree or certificate during the three-year tracking period. This is shown in columns 4 and 6 of Table 17. Only 0.8% (column 4) of the cohort completed a degree or certificate and enrolled at a four-year school some time during those three years.

Table 18 shows degrees or certificates received by program type, enrollment status, ethnicity, and school. Many more vocational students completed a degree or certificate than students enrolled in a two-year program (10.5% vs. 2.4%). Likewise, full-time students were much more likely to complete a degree or certificate than part-time students (13.1% vs. 1.0%).

There are substantial differences among ethnic groups in degree completion. Hispanics were most likely to complete degrees--7.1% did so. Less than 2% of blacks and Indians received degrees or certificates.

Schools also differed in the proportion of the starting cohort receiving degrees during the tracking period. The highest rates were realized at CMC (24.7%), CNCC (24.0%), and LCC (21.1%).

Continued Enrollment in a Two-Year School. While fewer than 15% of the cohort finished a degree or transferred to a four-year school, outcomes were nonetheless positive for the 15.7% who were still enrolled at their school of origin and the 1.7% who were enrolled somewhere else in the community college system (see columns 1 and 2 from Table 17). The continued enrollment percentage was almost the same for students in vocational and two-year programs (17.3% vs. 17.5%). Full-time students were slightly more likely to remain enrolled than part-time students (19.2% vs. 16.4%). The continued enrollment rate by ethnic group is also fairly constant, with the exception of the rate for Indians, which is only about 11.6%, compared to an average rate of 17.6% for the other ethnic groups. There is quite a variance in the continued enrollment rate across institutions. It ranges from a high of 31.9% as ASC to a low of 8.4% at MCC.

Any Positive Outcome. Overall, one-third of the cohort (32.0%) had a positive outcome (see Table 19). (Table 21 gives the data, by ethnic group, on which the success rate is based.) Vocational and two-year programs produced comparable percentages of positive outcomes. The percentage was 33.2% for vocational programs and 31.3% for two-year programs. The types of positive outcome differed, however. Students in two-year programs were twice as likely to have transferred to a four-year school, 12.2% vs. 6.3%, but less likely to have received a degree, 2.4% vs. 10.5% (see Table 17).

Students whose initial enrollment at a community college was full-time were almost twice as likely as part-time students to have positive outcomes after three years, 44.9% vs. 24.0%. Since continued enrollment was considered a positive

outcome, this finding is not simply a function of the longer time it takes a part-time student to fulfill program requirements.

Success rates were highest at Aims (56.6%), CMC (50.6%), CNCC (49.7%), LCC (44.0%), TSJC (43.3%), and ASC (41.4%). Some caution is warranted in interpreting the high success rates at Aims and CMC, though, since significant parts of their student cohorts were omitted from the data base due to missing data.

Ethnic Group Differences in Success Rates

For purposes of this analysis, the real issue is how minorities are faring--what the likelihood is of their achieving a positive outcome, both in absolute terms and relative to whites--and in which schools they are faring well. The analysis in this section is based on Table 19.

The likelihood of positive outcomes was highest for whites. One-third (33.1%) had transferred to a four-year school, received a degree, or were still pursuing studies in the two-year system. Minorities were less likely to be successful: 29.3% of Hispanics, 28.6% of Asians, 25.3% of blacks, and 20.5% of Indians had successful outcomes.

If full-time status is taken into account, the differences among ethnic groups look somewhat different. White students who enter community colleges as full-time students are quite a bit more likely to have a positive outcome than minority students. Almost half of these white students (48.0%) had positive outcomes, but only about a third of black, Indian, and Hispanic students did (30.9%, 32.3%, and

33.1%, respectively). Full-time Asian students are less likely than whites to have positive outcomes (41.9%) but more likely than blacks, Indians, and Hispanics.

The differences among ethnic groups of part-time students are less striking. Hispanics are most likely to have positive outcomes (26.4%), and Indians and Asians least likely (16% and 15.7%). Part-time white students have a 24.1% rate, about half of the rate for full-time students. The contrast is greatest for Asians, only 15.7% of part-time Asians have a positive outcome, compared to 41.9% of full-time Asians.

Ethnic group differences vary by program type as well. Hispanic students in vocational programs are slightly more likely to achieve a positive outcome (34.9%) than white students (33.5%). Success rates are lower for blacks (23.1%) and Indians (16.7%). All the minority groups do less well in two-year programs than white students. Blacks--with a 26.5% success rate--come closest to matching the white rate (32.8%). About 23% of both Indians and Hispanics in two-year programs had positive outcomes.

Differences in Transfer Rate by School

As mentioned earlier, the percentage of community college students who transfer to four-year institutions is quite low for the system as a whole: only 9.8% of the starting cohort in 1986 enrolled in a public four-year college or university in fall 1987 or fall 1988. Table 20 summarizes the transfer data by institution and ethnic group. (Table 21 gives the detailed data, by ethnic group, that is summarized in Table 20.) The transfer rate for whites (10.8%) is more than twice that of blacks

(5.2%) or Hispanics (5.1%). Eight percent of Indians transfer to a four-year program.

Summary Measures for the Community College Cohort

Similarly to Table 11 for the four-year cohort, a summary score is calculated as the average of the four indices, with the indices that are calculated relative to whites at the same school being given double weight. The summary scores are listed in the right most column in Table 22.

1. Percent of students with any positive outcome compared to all students of the same ethnic group (see Table 19).

2. Percent of students with any positive outcome compared to white students in the same school (see Table 19).

3. Percent of students transferring to a four-year school compared to all students of same ethnic group (see Table 20).

4. Percent of students transferring to a four-year school compared to white students in the same school (see Table 20).

The summary measure is an average of the four index scores, with items two and four--those that emphasize relative differences to whites at the same school--given double weighting. Summary scores and the four indices are reported in Table 22. The following lists the institutions that seem to do the best for each ethnic group:

Blacks: It is important to note that only six community colleges had more than 10 black students in the cohort and that two schools (TSJC and FRCC) had fewer than 25. The highest summary scores were at TSJC (1.21) and CCD (1.08). Other institutions with a summary score greater than the average score for all blacks (0.75) were FRCC (0.89) and PPCC (0.89).

Indians: Seven schools had Indian cohorts consisting of ten or more students, but at no school did the cohort exceed 26. The highest summary scores were found at RRCC (1.37) and PPCC (1.00). Six of the seven institutions had a summary score greater than the average for all Indians (0.79). Only PCC had a lower summary score (0.41), but since the cohort at PCC was only 10 students, caution should be used in drawing conclusions from this score.

Hispanics: The Hispanic cohort was big enough to analyze at all the community colleges except CMC. Several schools had a summary score greater than 1.00: Mesa (2.49), PCC (1.39), CNCC (1.28), ACC (1.17), and ASC (1.17). The score was also higher than the average for all Hispanics (0.92) at TSJC (0.93).

Asians: There were five institutions with 10 or more Asians in the cohort. Of these, PPCC (2.04) and ACC (1.40) have

summary scores greater than 1.00. These are also the only institutions with summary scores greater than the average for all Asians (0.92).

Whites: The summary score for whites is simply the average of indices 1 and 3. The average for all whites is 1.00. Seven of the 16 institutions had summary scores greater than 1.00: Aims (2.39), CNCC (1.50), CMC (1.38), LCC (1.26), OJC (1.17), ASC (1.16), and PPCC (1.05).

Caveats

It is important to repeat here the cautions given earlier for the interpretation of Table 11. The data presented in Table 22 is both interesting and informative in many respects, but this table, and indeed this entire analysis, must be seen as only the first step in studying success rates at public community colleges in Colorado. The earlier analyses showed great variations by full-time/part-time status and whether or not a student was in a vocational or a two-year degree program, but the data in Tables 21 and 22 do not include these variables. Additional analysis must be done, as more years of data are available, to include these and other factors in the analysis. These further analyses should cast further light on the status of minorities in Colorado higher education.

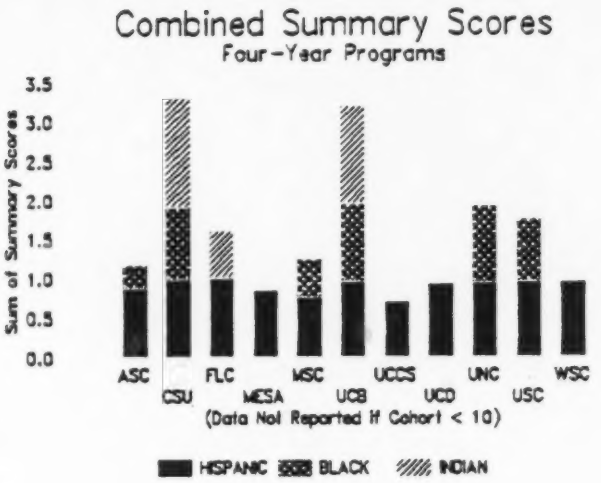
## CONCLUSION

The final stage in this preliminary analysis of data supplied by the Cohort Tracking System was to graph the summary measures developed for four-year institutions and for community colleges. The graphs were created as an attempt to summarize, for Hispanics, blacks, and Indians, the summary measures and to see if the graphs helped to identify the institutions that performed relatively well with respect to minority students.

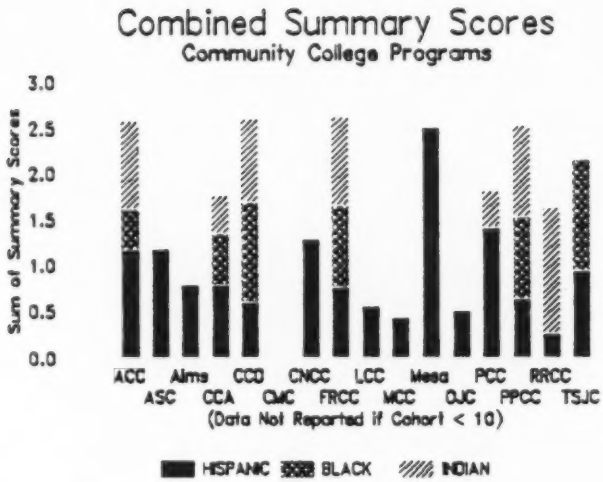
Those graphs, reproduced below, have all the limitations referred to earlier. They are highly generalized and abstract, many stages removed from the experience of an actual student at an actual school. They are based on only three years' worth of data. They do not account for variables that were not included in this preliminary analysis but that could well prove significant in subsequent analyses. The graphs should not be interpreted as final ratings of institutions, and inferences about relative performance and rankings of institutions may be inappropriate.

But the graphs do paint a composite picture, and they are offered here for their potential usefulness to educators and policy makers who are concerned about the retention and progress of minority college students in Colorado.

## Figure 1[1]




## Figure 2[1]




[1]Caution should be used in inferring the relative ranking or performance of institutions in this graph. The graph summarizes measures developed in Appendix B, "Development of Minority Retention Measures". Future refinement of the analyses, especially including additional factors such as full-time/part-time status, may change the relative rankings of the institutions.

Table 1
Listing of Four-Year Colleges

| | |
|---|---|
| Adams State College | ASC |
| Colorado School of Mines[1] | CSM |
| Colorado State University | CSU |
| Fort Lewis College | FLC |
| Mesa State College | Mesa |
| Metropolitan State College | MSC |
| University of Colorado, Boulder | UCB |
| University of Colorado, Colorado Springs | UCCS |
| University of Colorado, Denver | UCD |
| University of Northern Colorado | UNC |
| University of Southern Colorado | USC |
| Western State College | WSC |

[1]Because the Colorado School of Mines did not use social security numbers as identifiers throughout the study period its data could not be merged with that of the other four-year schools. Although some tables record data provided by CSM, tracking the movement of students to and from this institution was not possible.

Table 2
Freshmen Cohort 1986, Four-Year Institutions
Ethnic Breakdown by Percentage

Cohort Size

| | All | Blacks | Indians | Hispanics | Asians | Whites |
|---|---|---|---|---|---|---|
| ASC | 373 | 10 | 8 | 82 | 4 | 269 |
| CSM | 303 | 4 | 2 | 18 | 8 | 271 |
| CSU | 2735 | 51 | 17 | 116 | 68 | 2483 |
| FLC | 1036 | 6 | 74 | 49 | 10 | 897 |
| Mesa | 368 | 3 | 3 | 13 | 2 | 347 |
| MSC | 1431 | 60 | 6 | 156 | 47 | 1162 |
| UCB | 3499 | 75 | 10 | 158 | 183 | 3073 |
| UCCS | 316 | 8 | 2 | 27 | 13 | 266 |
| UCD | 304 | 8 | 5 | 25 | 36 | 230 |
| UNC | 1497 | 25 | 7 | 79 | 18 | 1368 |
| USC | 473 | 29 | 2 | 100 | 6 | 336 |
| WSC | 341 | 5 | 1 | 19 | 4 | 312 |
| All Students | 12676 | 284 | 137 | 842 | 399 | 11014 |

Percentages

| | All | Blacks | Indians | Hispanics | Asians | Whites |
|---|---|---|---|---|---|---|
| ASC | 100.0% | 2.7% | 2.1% | 22.0% | 1.1% | 72.1% |
| CSM | 100.0% | 1.3% | .6% | 5.9% | 2.6% | 89.4% |
| CSU | 100.0% | 1.9% | 0.6% | 4.2% | 2.5% | 90.8% |
| FLC | 100.0% | 0.6% | 7.1% | 4.7% | 1.0% | 86.6% |
| Mesa | 100.0% | 0.8% | 0.8% | 3.5% | 0.5% | 94.3% |
| MSC | 100.0% | 4.2% | 0.4% | 10.9% | 3.3% | 81.2% |
| UCB | 100.0% | 2.1% | 0.3% | 4.5% | 5.2% | 87.8% |
| UCCS | 100.0% | 2.5% | 0.6% | 8.5% | 4.1% | 84.2% |
| UCD | 100.0% | 2.6% | 1.6% | 8.2% | 11.8% | 75.7% |
| UNC | 100.0% | 1.7% | 0.5% | 5.3% | 1.2% | 91.4% |
| USC | 100.0% | 6.1% | 0.4% | 21.1% | 1.3% | 71.0% |
| WSC | 100.0% | 1.5% | 0.3% | 5.6% | 1.2% | 91.5% |
| All Students | 100.0% | 2.2% | 1.1% | 6.6% | 3.2% | 86.9% |

Table 3
Enrollment Patterns at Four-Year Schools of Origin
by Ethnicity and Institution

| | Total Number | First Year Only | Years One & Two | Years One & Three | All Three Years | Return Rate[1] |
|---|---|---|---|---|---|---|
| All Students | 12676 | 27.8% | 16.1% | 3.1% | 53.0% | 10.0% |
| **Ethnicity** | | | | | | |
| Blacks | 284 | 40.4 | 18.2 | 5.0 | 36.4 | 11.0 |
| Indian | 137 | 58.5 | 10.4 | 3.7 | 27.4 | 6.0 |
| Hispanics | 842 | 36.3 | 14.9 | 3.4 | 45.4 | 8.6 |
| Asians | 399 | 22.8 | 16.4 | 2.8 | 58.1 | 10.9 |
| White | 11014 | 26.6 | 16.2 | 3.0 | 54.1 | 10.1 |
| **Institutions** | | | | | | |
| ASC | 373 | 39.1 | 15.0 | 1.6 | 44.2 | 3.9 |
| CSM | 303 | 26.7 | nr | nr | 58.1 | nr |
| CSU | 2735 | 20.8 | 13.5 | 2.5 | 63.1 | 10.7 |
| FLC | 1036 | 39.0 | 21.8 | 2.3 | 36.9 | 5.6 |
| Mesa | 368 | 38.0 | 21.2 | 3.0 | 37.8 | 7.3 |
| MSC | 1431 | 43.2 | 19.1 | 3.6 | 34.1 | 7.7 |
| UCB | 3499 | 15.4 | 14.7 | 3.5 | 66.4 | 18.5 |
| UCCS | 316 | 39.6 | 13.9 | 5.4 | 41.1 | 12.0 |
| UCD | 304 | 38.5 | 17.8 | 5.6 | 38.2 | 12.7 |
| UNC | 1497 | 32.9 | 14.8 | 2.2 | 50.0 | 6.3 |
| USC | 473 | 32.3 | 17.1 | 5.3 | 45.2 | 14.1 |
| WSC | 341 | 40.5 | 20.5 | 2.3 | 36.7 | 5.4 |

nr= not reported

[1]Return rate: Percent of those not enrolled in year 2 who enroll in year 3 [(year one & three) / ((first year only) + (year one & three))]

Table 4
Within-School Retention Percentage
of Four-Year Cohort Enrolled All Three Years

| | All | Blacks | Indians | Hispanics | Asians | Whites |
|---|---|---|---|---|---|---|
| ASC | 44.2 | 10.0 | * | 41.5 | * | 46.8 |
| CSM | 58.1 | * | * | 55.6 | * | 58.1 |
| CSU | 63.1 | 49.0 | 47.1 | 56.0 | 64.7 | 63.8 |
| FLC | 36.9 | * | 18.9 | 42.9 | 30.0 | 38.1 |
| Mesa | 37.8 | * | * | 38.5 | * | 37.8 |
| MSC | 34.1 | 16.7 | * | 30.8 | 48.9 | 34.9 |
| UCB | 66.4 | 52.0 | 60.0 | 58.9 | 64.5 | 67.3 |
| UCCS | 41.1 | * | * | 29.6 | 46.2 | 42.1 |
| UCD | 38.2 | * | * | 40.0 | 55.6 | 37.0 |
| UNC | 50.0 | 44.0 | * | 45.6 | 33.3 | 50.7 |
| USC | 45.2 | 31.0 | * | 46.0 | * | 46.1 |
| WSC | 36.7 | * | * | 42.1 | * | 36.9 |
| All Students | 53.0 | 36.4 | 27.4 | 45.4 | 58.1 | 54.1 |

Table 5
Ethnic and Institutional Differences in Progression
for Four-Year Cohort

| | Students Enrolled in Year 2 | | Students Enrolled in Year 3 | |
|---|---|---|---|---|
| | Number | % Who Are Sophs or More | Number | % Who Are Juniors or More |
| All students | 8546 | 59.9 | 6557 | 57.4 |
| By ethnicity | | | | |
| Blacks | 153 | 33.3 | 102 | 37.3 |
| Indians | 51 | 45.1 | 37 | 48.6 |
| Hispanics | 497 | 46.5 | 374 | 46.0 |
| Asians | 291 | 59.1 | 227 | 59.9 |
| Whites | 7554 | 61.5 | 5817 | 58.5 |
| By institution | | | | |
| ASC | 221 | 56.6 | 165 | 60.6 |
| CSU | 2096 | 61.2 | 1726 | 59.2 |
| FLC | 608 | 38.5 | 382 | 38.2 |
| Mesa | 217 | 91.2 | 139 | 84.2 |
| MSC | 761 | 59.9 | 488 | 45.5 |
| UCB | 2838 | 67.7 | 2323 | 66.7 |
| UCCS | 174 | 27.6 | 130 | 27.7 |
| UCD | 170 | 36.5 | 116 | 33.6 |
| UNC | 971 | 58.0 | 749 | 49.9 |
| USC | 295 | 51.2 | 214 | 50.5 |
| WSC | 195 | 41.5 | 125 | 42.4 |

Table 6
Progress of Four-Year Cohort Toward a Four-Year Degree

| | Percentage Enrolled in Year Two Who Are Sophomores or More | | | | | Minority Student Progress Indexed Relative to White Student Progress | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Black | Indian | Hispanic | Asian | White | Black | Indian | Hispanic | Asian | White |
| ASC | * | * | 36% | * | 64% | * | * | 0.56 | * | 1.00 |
| CSU | 35% | 40% | 43% | 60% | 63% | 0.56 | 0.63 | 0.68 | 0.95 | 1.00 |
| FLC | * | 39% | 37% | * | 39% | * | 1.00 | 0.95 | * | 1.00 |
| Mesa | * | * | * | * | 92% | * | * | * | * | 1.00 |
| MSC | 52% | * | 55% | 55% | 61% | 0.85 | * | 0.90 | 0.90 | 1.00 |
| UCB | 29% | * | 54% | 66% | 69% | 0.42 | * | 0.78 | 0.96 | 1.00 |
| UCCS | * | * | 20% | * | 27% | * | * | 0.74 | * | 1.00 |
| UCD | * | * | 27% | 54% | 35% | * | * | 0.77 | 1.54 | 1.00 |
| UNC | 36% | * | 49% | 42% | 59% | 0.61 | * | 0.83 | 0.71 | 1.00 |
| USC | 23% | * | 48% | * | 54% | 0.43 | * | 0.89 | * | 1.00 |
| WSC | * | * | 27% | * | 43% | * | * | 0.63 | * | 1.00 |
| Student average | 33% | 45% | 47% | 59% | 62% | 0.54 | 0.73 | 0.76 | 0.96 | 1.00 |

| | Percentage Enrolled in Year Three Who Are Juniors or More | | | | | Minority Student Progress Indexed Relative to White Student Progress | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Black | Indian | Hispanic | Asian | White | Black | Indian | Hispanic | Asian | White |
| ASC | * | * | 44% | * | 66% | * | * | 0.67 | * | 1.00 |
| CSU | 44% | * | 48% | 55% | 60% | 0.73 | * | 0.80 | 0.92 | 1.00 |
| FLC | * | 43% | 33% | * | 39% | * | 1.10 | 0.85 | * | 1.00 |
| Mesa | * | * | * | * | 85% | * | * | * | * | 1.00 |
| MSC | 40% | * | 40% | 44% | 46% | 0.87 | * | 0.87 | 0.96 | 1.00 |
| UCB | 41% | * | 57% | 69% | 68% | 0.60 | * | 0.84 | 1.01 | 1.00 |
| UCCS | * | * | * | * | 25% | * | * | * | * | 1.00 |
| UCD | * | * | 20% | 50% | 32% | * | * | 0.63 | 1.56 | 1.00 |
| UNC | 36% | * | 44% | * | 50% | 0.72 | * | 0.88 | * | 1.00 |
| USC | * | * | 46% | * | 54% | * | * | 0.85 | * | 1.00 |
| WSC | * | * | * | * | 45% | * | * | * | * | 1.00 |
| Student average | 37% | 49% | 46% | 60% | 59% | 0.63 | 0.83 | 0.78 | 1.02 | 1.00 |



BEST COPY AVAILABLE

Table 7
Percentage of Four-Year Cohort Attending
a Different Colorado School in Year 3

| | All | Blacks | Indians | Hispanics | Asians | Whites |
|---|---|---|---|---|---|---|
| ASC | 11.8% | 10.0% | * | 9.8% | * | 13.0% |
| CSU | 10.4% | 7.9% | 5.9% | 16.4% | 13.2% | 10.2% |
| FLC | 21.1% | * | 4.1% | 20.5% | 20.0% | 22.6% |
| Mesa | 12.3% | * | * | * | * | 12.6% |
| MSC | 12.3% | 8.4% | * | 6.5% | 17.0% | 13.1% |
| UCB | 4.3% | 9.3% | * | 4.4% | 4.4% | 4.2% |
| UCCS | 12.3% | * | * | 11.1% | 15.4% | 12.5% |
| UCD | 17.7% | * | * | 8.0% | 8.4% | 20.8% |
| UNC | 16.5% | 12.0% | * | 17.8% | 33.4% | 16.3% |
| USC | 13.8% | 17.1% | * | 10.0% | * | 14.3% |
| WSC | 15.2% | * | * | 5.3% | 0.0% | 15.7% |
| All Students With-In School Drop-Outs[1] | 11.2% | 11.1% | 5.2% | 5.3% | 10.4% | 11.3% |
| "Drop-Outs" that Transferred | 43.9% | 58.6% | 68.9% | 51.2% | 39.2% | 42.8% |
| | 25.5% | 18.9% | 7.5% | 10.4% | 26.5% | 26.4% |

[1]See Table 3, sum of "First-Year Only" and "Years One & Two"

Table 8
Where Transfers from the Four-Year Cohort Go
Based on Year 3 Enrollment

| | N | PERCENTAGE ATTENDING: UCB, CSU | UCD, UCCS UNC | Other 4-Yr | 2-Yr |
|---|---|---|---|---|---|
| All students who transfer: | 1377 | 34.6 | 19.7 | 24.8 | 20.5 |
| By ethnicity: | | | | | |
| Black | 31 | 35.5 | 22.6 | 16.1 | 25.8 |
| Indian | 7 | * | * | * | * |
| Hispanic | 84 | 29.8 | 19.0 | 27.4 | 23.8 |
| Asian | 41 | 31.7 | 14.6 | 24.4 | 26.8 |
| White | 1214 | 35.0 | 19.9 | 24.6 | 20.0 |
| By institution of origin: | | | | | |
| ASC | 44 | 27.3 | 11.4 | 47.7 | 11.4 |
| CSU | 285 | 19.3 | 32.3 | 34.4 | 14.0 |
| FLC | 219 | 46.6 | 16.4 | 21.5 | 15.5 |
| Mesa | 45 | 35.6 | 15.6 | 33.3 | 15.6 |
| MSC | 176 | 34.1 | 23.3 | 6.8 | 35.8 |
| UCB | 151 | 19.2 | 30.5 | 28.5 | 18.5 |
| UCCS | 39 | 53.8 | 17.9 | 7.7 | 20.5 |
| UCD | 54 | 53.7 | 1.9 | 27.8 | 16.7 |
| UNC | 247 | 38.1 | 5.7 | 27.9 | 28.3 |
| USC | 65 | 50.8 | 13.8 | 13.8 | 21.5 |
| WSC | 52 | 48.1 | 25.0 | 19.2 | 7.7 |


211

BEST COPY AVAILABLE

Table 9
Within-System Enrollment
of Four-Year Cohort
at Any Public Institution in Colorado

| | (n) | First Year Only | Years One & Two | Years One & Three | All Three Years |
|---|---|---|---|---|---|
| All students | 12373 | 18.5% | 14.2% | 4.6% | 62.7% |
| By ethnicity | | | | | |
| Blacks | 280 | 30.4% | 17.1% | 6.4% | 46.1% |
| Indians | 135 | 51.9% | 11.9% | 3.7% | 32.6% |
| Hispanics | 824 | 25.8% | 15.2% | 5.5% | 53.5% |
| Asians | 391 | 16.1% | 12.5% | 3.6% | 67.8% |
| Whites | 10743 | 17.3% | 14.2% | 4.5% | 64.0% |
| By school of origin | | | | | |
| ASC | 373 | 28.7% | 13.7% | 3.5% | 54.2% |
| CSU | 2735 | 13.0% | 11.0% | 3.9% | 72.1% |
| FLC | 1036 | 23.2% | 16.5% | 6.7% | 53.7% |
| Mesa | 368 | 27.7% | 19.3% | 3.8% | 49.2% |
| MSC | 1431 | 32.6% | 17.4% | 5.5% | 44.5% |
| UCB | 3499 | 11.7% | 14.1% | 4.3% | 69.9% |
| UCCS | 316 | 29.1% | 12.0% | 4.4% | 54.4% |
| UCD | 304 | 24.0% | 14.5% | 7.6% | 53.9% |
| UNC | 1497 | 17.1% | 14.2% | 3.9% | 64.9% |
| USC | 473 | 20.9% | 12.7% | 6.3% | 60.0% |
| WSC | 341 | 26.1% | 19.6% | 3.5% | 50.7% |

Table 10
Indices Summarizing Within-System
and Within-School Retention
for the Four-Year Cohort

| | Number in cohort | WITHIN SCHOOL: % enrolled all 3 yrs | WITHIN SCHOOL: Index Relative to: all in Same Grp | WITHIN SCHOOL: Index Relative to: Whites in Same Schl | WITHIN SYSTEM: % enrolled all 3 yrs | WITHIN SYSTEM: Index Relative to: all in Same Grp | WITHIN SYSTEM: Index Relative to: Whites in Same Schl |
|---|---|---|---|---|---|---|---|
| **All Students** | | | | | | | |
| Blacks | 284 | 36.4 | 1.00 | 0.67 | 46.1 | 1.00 | 0.72 |
| Indians | 137 | 27.4 | 1.00 | 0.51 | 32.6 | 1.00 | 0.51 |
| Hispanics | 842 | 45.4 | 1.00 | 0.84 | 67.8 | 1.00 | 1.06 |
| Asians | 399 | 58.1 | 1.00 | 1.07 | 53.5 | 1.00 | 0.84 |
| Whites | 11014 | 54.1 | 1.00 | 1.00 | 64.0 | 1.00 | 1.00 |
| **Adams State** | | | | | | | |
| Blacks | 10 | 10.0 | 0.27 | 0.21 | 20.0 | 0.43 | 0.35 |
| Indians | 8 | * | * | * | * | * | * |
| Hispanics | 82 | 41.5 | 0.91 | 0.89 | 50.0 | 0.74 | 0.87 |
| Asians | 4 | * | * | * | | | |
| Whites | 269 | 46.8 | 0.87 | 1.00 | 57.6 | 0.90 | 1.00 |
| **Colorado State Univ** | | | | | | | |
| Blacks | 51 | 49.0 | 1.35 | 0.77 | 54.9 | 1.19 | 0.75 |
| Indians | 17 | 47.1 | 1.72 | 0.74 | 52.9 | 1.62 | 0.73 |
| Hispanics | 116 | 56.0 | 1.23 | 0.88 | 68.1 | 1.00 | 0.94 |
| Asians | 68 | 64.7 | 1.11 | 1.01 | 77.9 | 1.46 | 1.07 |
| Whites | 2483 | 63.8 | 1.18 | 1.00 | 72.6 | 1.13 | 1.00 |
| **Fort Lewis College** | | | | | | | |
| Blacks | 6 | * | * | * | * | * | * |
| Indians | 74 | 18.9 | 0.69 | 0.50 | 21.6 | 0.66 | 0.38 |
| Hispanics | 49 | 42.9 | 0.94 | 1.13 | 55.1 | 0.81 | 0.98 |
| Asians | 10 | 30.0 | 0.52 | 0.79 | 40.0 | 0.75 | 0.71 |
| Whites | 897 | 38.1 | 0.70 | | 56.4 | 0.88 | 1.00 |
| **Mesa State** | | | | | | | |
| Blacks | 3 | * | * | * | * | * | * |
| Indians | 3 | * | * | * | * | * | * |
| Hispanics | 13 | 38.5 | 0.85 | 1.02 | 38.5 | 0.57 | 0.78 |
| Asians | 2 | * | * | * | * | * | * |
| Whites | 347 | 37.8 | 0.70 | 1.00 | 49.6 | 0.78 | 1.00 |
| **Metro State** | | | | | | | |
| Blacks | 60 | 16.7 | 0.46 | 0.48 | 23.3 | 0.51 | 0.50 |
| Indians | 6 | * | * | * | * | * | * |
| Hispanics | 156 | 30.8 | 0.68 | 0.88 | 35.3 | 0.52 | 0.77 |
| Asians | 47 | 48.9 | 0.84 | 1.40 | 63.8 | 1.19 | 1.38 |
| Whites | 1162 | 34.9 | 0.65 | 1.00 | 46.1 | 0.72 | 1.00 |
| **Univ of Colo, Boulder** | | | | | | | |
| Blacks | 75 | 52.0 | 1.43 | 0.77 | 60.0 | 1.30 | 0.85 |
| Indians | 10 | 60.0 | 2.19 | 0.89 | 60.0 | 1.84 | 0.85 |
| Hispanics | 158 | 58.9 | 1.30 | 0.88 | 62.0 | 0.91 | 0.88 |
| Asians | 183 | 64.5 | 1.11 | 0.96 | 68.3 | 1.28 | 0.97 |
| Whites | 3073 | 67.3 | 1.24 | 1.00 | 70.7 | 1.10 | 1.00 |
| **Univ of Colo, Colo. Springs** | | | | | | | |
| Blacks | 8 | * | * | * | * | * | * |
| Indians | 2 | * | * | * | * | * | * |
| Hispanics | 27 | 29.6 | 0.65 | 0.70 | 40.7 | 0.60 | 0.74 |
| Asians | 13 | 46.2 | 0.80 | 1.10 | 61.5 | 1.15 | 1.11 |
| Whites | 266 | 42.1 | 0.78 | 1.00 | 55.3 | 0.86 | 1.00 |



BEST COPY AVAILABLE

Table 10 (continued)

| | Number in cohort | WITHIN SCHOOL: % enrolled all 3 yrs | WITHIN SCHOOL: Index Relative to: all in Same Grp | WITHIN SCHOOL: Index Relative to: Whites in Same Schl | WITHIN SYSTEM: % enrolled all 3 yrs | WITHIN SYSTEM: Index Relative to: all in Same Grp | WITHIN SYSTEM: Index Relative to: Whites in Same Schl |
|---|---|---|---|---|---|---|---|
| **Univ of Colo, Denver** | | | | | | | |
| Blacks | 8 | * | * | * | * | * | * |
| Indians | 5 | * | * | * | * | * | * |
| Hispanics | 25 | 40.0 | 0.93 | 1.08 | 48.0 | 0.71 | 0.87 |
| Asians | 36 | 55.6 | 0.96 | 1.50 | 63.9 | 1.19 | 1.16 |
| Whites | 230 | 37.0 | 0.68 | 1.00 | 55.2 | 0.86 | 1.00 |
| **Univ of Northern Colo** | | | | | | | |
| Blacks | 25 | 44.0 | 1.21 | 0.87 | 56.0 | 1.21 | 0.86 |
| Indians | 7 | * | * | * | * | * | * |
| Hispanics | 79 | 45.6 | 1.00 | 0.90 | 60.8 | 0.90 | 0.93 |
| Asians | 18 | 33.3 | 0.57 | 0.66 | 66.7 | 1.25 | 1.02 |
| Whites | 1368 | 50.7 | 0.94 | 1.00 | 65.3 | 1.02 | 1.00 |
| **Univ of Southern Colo** | | | | | | | |
| Blacks | 29 | 31.0 | 0.85 | 0.67 | 48.3 | 1.05 | 0.79 |
| Indians | 2 | * | * | * | * | * | * |
| Hispanics | 100 | 46.0 | 1.01 | 1.00 | 56.0 | 0.83 | 0.92 |
| Asians | 6 | * | * | * | * | * | * |
| Whites | 336 | 46.1 | 0.85 | 1.00 | 61.0 | 0.95 | 1.00 |
| **Western State College** | | | | | | | |
| Blacks | 5 | * | * | * | * | * | * |
| Indians | 1 | * | * | * | * | * | * |
| Hispanics | 19 | 42.1 | 0.93 | 1.14 | 47.4 | 0.70 | 0.92 |
| Asians | 4 | * | * | * | * | * | * |
| Whites | 312 | 36.9 | 0.68 | 1.00 | 51.3 | 0.80 | 1.00 |

Table 11
Summary of Index Measures for the Four-Year Cohort

Index 1: within-school retention relative to all students with the same ethnicity

Index 2: within-school retention relative to whites in same school

Index 3: within-system retention relative to all students with the same ethnicity

Index 4: within-system retention relative to whites in same school

Index 5: minority student progress in year three indexed to whites (from Table 6)

Summary Score: weighted index = [Index 1 + (2 x Index 2) + Index 3 + (2 x Index 4)] / 6

| | Number | Summary Score | Index 1 | Index 2 | Index 3 | Index 4 | Index 5 |
|---|---|---|---|---|---|---|---|
| **BLACKS** | | | | | | | |
| ASC | 10 | 0.30 | 0.27 | 0.21 | 0.43 | 0.35 | * |
| CSU | 51 | 0.93 | 1.35 | 0.77 | 1.19 | 0.75 | 0.73 |
| FLC | 6 | * | * | * | * | * | * |
| MESA | 3 | * | * | * | * | * | * |
| MSC | 60 | 0.49 | 0.46 | 0.48 | 0.51 | 0.50 | 0.87 |
| UCB | 75 | 1.00 | 1.43 | 0.77 | 1.30 | 0.85 | 0.60 |
| UCCS | 8 | * | * | * | * | * | * |
| UCD | 8 | * | * | * | * | * | * |
| UNC | 25 | 0.98 | 1.21 | 0.87 | 1.21 | 0.86 | 0.72 |
| USC | 29 | 0.80 | 0.85 | 0.67 | 1.05 | 0.79 | * |
| WSC | 5 | * | * | * | * | * | * |
| **INDIANS** | | | | | | | |
| ASC | 8 | * | * | * | * | * | * |
| CSU | 17 | 1.39 | 1.72 | 0.74 | 1.62 | 0.73 | * |
| FLC | 74 | 0.62 | 0.69 | 0.50 | 0.66 | 0.38 | 1.10 |
| MESA | 3 | * | * | * | * | * | * |
| MSC | 6 | * | * | * | * | * | * |
| UCB | 10 | 1.25 | 2.19 | 0.89 | 1.84 | 0.85 | * |
| UCCS | 2 | * | * | * | * | * | * |
| UCD | 5 | * | * | * | * | * | * |
| UNC | 7 | * | * | * | * | * | * |
| USC | 2 | * | * | * | * | * | * |
| WSC | 1 | * | * | * | * | * | * |
| **HISPANICS** | | | | | | | |
| ASC | 82 | 0.86 | 0.91 | 0.89 | 0.74 | 0.87 | 0.88 |
| CSU | 116 | 0.98 | 1.23 | 0.88 | 1.00 | 0.94 | 0.87 |
| FLC | 49 | 1.00 | 0.94 | 1.13 | 0.81 | 0.98 | 0.67 |
| MESA | 13 | 0.84 | 0.85 | 1.02 | 0.57 | 0.78 | 0.63 |
| MSC | 156 | 0.75 | 0.68 | 0.88 | 0.52 | 0.77 | 0.85 |
| UCB | 158 | 0.96 | 1.30 | 0.88 | 0.91 | 0.88 | 0.84 |
| UCCS | 27 | 0.69 | 0.65 | 0.70 | 0.60 | 0.74 | * |
| UCD | 25 | 0.92 | 0.93 | 1.08 | 0.71 | 0.87 | 0.85 |
| UNC | 79 | 0.93 | 1.00 | 0.90 | 0.90 | 0.93 | * |
| USC | 100 | 0.95 | 1.01 | 1.00 | 0.83 | 0.92 | * |
| WSC | 19 | 0.96 | 0.93 | 1.14 | 0.70 | 0.92 | 0.80 |

Table 11 (continued)

| | Number | Summary Score | Index 1 | Index 2 | Index 3 | Index 4 | Index 5 |
|---|---|---|---|---|---|---|---|
| **ASIANS** | | | | | | | |
| ASC | 4 | * | * | * | * | * | * |
| CSU | 68 | 1.12 | 1.11 | 1.01 | 1.46 | 1.07 | 0.92 |
| FLC | 10 | 0.71 | 0.52 | 0.79 | 0.75 | 0.71 | * |
| MESA | 2 | * | * | * | * | * | * |
| MSC | 47 | 1.27 | 0.84 | 1.40 | 1.19 | 1.38 | 0.96 |
| UCB | 183 | 1.04 | 1.11 | 0.96 | 1.28 | 0.97 | 1.01 |
| UCCS | 13 | 1.06 | 0.80 | 1.10 | 1.15 | 1.11 | * |
| UCD | 36 | 1.25 | 0.96 | 1.50 | 1.19 | 1.16 | 1.56 |
| UNC | 18 | 0.86 | 0.57 | 0.66 | 1.25 | 1.02 | * |
| USC | 6 | * | * | * | * | * | * |
| WSC | 4 | * | * | * | * | * | * |
| **WHITES**[1] | | | | | | | |
| ASC | 269 | 0.89 | 0.87 | 1.00 | 0.90 | 1.00 | |
| CSU | 2483 | 1.16 | 1.18 | 1.00 | 1.13 | 1.00 | |
| FLC | 897 | 0.79 | 0.70 | 1.00 | 0.88 | 1.00 | |
| MESA | 347 | 0.74 | 0.70 | 1.00 | 0.78 | 1.00 | |
| MSC | 1162 | 0.69 | 0.65 | 1.00 | 0.72 | 1.00 | |
| UCB | 3073 | 1.17 | 1.24 | 1.00 | 1.10 | 1.00 | |
| UCCS | 266 | 0.82 | 0.78 | 1.00 | 0.86 | 1.00 | |
| UCD | 230 | 0.77 | 0.68 | 1.00 | 0.86 | 1.00 | |
| UNC | 1368 | 0.98 | 0.94 | 1.00 | 1.02 | 1.00 | |
| USC | 336 | 0.90 | 0.85 | 1.00 | 0.95 | 1.00 | |
| WSC | 312 | 0.74 | 0.68 | 1.00 | 0.80 | 1.00 | |

[1]Summary score for whites is the average of Index 1 and Index 3.

Table 12
Colorado Community Colleges

State Board of Community Colleges and Occupational Education

| | |
|---|---|
| Arapahoe Community College | (ACC) |
| Community College of Aurora | (CCA) |
| Community College of Denver | (CCD) |
| Front Range Community College | (FRCC) |
| Lamar Community College | (LCC) |
| Morgan Community College | (MCC) |
| Otero Junior College | (OJC) |
| Pikes Peak Community College | (PPCC) |
| Pueblo Community College | (PCC) |
| Red Rocks Community College | (RRCC) |
| Trinidad State Junior College | (TSJC) |

Local District Colleges

| | |
|---|---|
| Aims Community College | (Aims) |
| Colorado Mountain College | (CMC) |
| Colorado Northwestern Community College | (CNCC) |
| Northeastern Junior College[1] | (NJC) |

Four-Year State Colleges Offering Two-Year Programs

| | |
|---|---|
| Adams State College | (ASC) |
| Mesa State College | (Mesa) |

[1]Unfortunately, data for Northeastern Junior College is missing from the database. That school's data tape was accidentally destroyed before the longitudinal database could be created by CCHE.

Table 13
Initial Community College Cohort
by Institution, Program Type, and Enrollment Status

| | TOTAL STUDENTS | VOCATIONAL PROGRAM | TWO-YEAR PROGRAM | OTHER PROGRAM |
|---|---|---|---|---|
| All students | 13,829 | 4,550 | 7,173 | 2,106 |
| 12+ credit hrs. | 4,171 | 1,918 | 2,250 | 3 |
| 1-11 credit hrs. | 7,292 | 2,316 | 4,812 | 164 |
| 0 credit hrs. | 2,366 | 316 | 111 | 1,939 |
| ACC | 1,924 | 530 | 1,394 | 0 |
| 12+ credit hrs. | 479 | 144 | 335 | 0 |
| 1-11 credit hrs. | 1,445 | 386 | 1,059 | 0 |
| 0 credit hrs. | 0 | 0 | 0 | 0 |
| CCA | 457 | 201 | 256 | 0 |
| 12+ credit hrs. | 66 | 25 | 41 | 0 |
| 1-11 credit hrs. | 383 | 172 | 211 | 0 |
| 0 credit hrs. | 8 | 4 | 4 | 0 |
| CCD | 977 | 426 | 551 | 0 |
| 12+ credit hrs. | 391 | 221 | 170 | 0 |
| 1-11 credit hrs. | 586 | 205 | 381 | 0 |
| 0 credit hrs. | 0 | 0 | 0 | 0 |
| FRCC | 1,105 | 633 | 472 | 0 |
| 12+ credit hrs. | 378 | 237 | 141 | 0 |
| 1-11 credit hrs. | 727 | 396 | 331 | 0 |
| 0 credit hrs. | 0 | 0 | 0 | 0 |
| LCC | 201 | 149 | 52 | 0 |
| 12+ credit hrs. | 127 | 125 | 2 | 0 |
| 1-11 credit hrs. | 74 | 24 | 50 | 0 |
| 0 credit hrs. | 0 | 0 | 0 | 0 |
| MCC | 284 | 61 | 223 | 0 |
| 12+ credit hrs. | 65 | 48 | 17 | 0 |
| 1-11 credit hrs. | 216 | 13 | 203 | 0 |
| 0 credit hrs. | 3 | 0 | 3 | 0 |

Table 13
(continued)

| | TOTAL STUDENTS | VOCATIONAL PROGRAM | TWO-YEAR PROGRAM | OTHER PROGRAM |
|---|---|---|---|---|
| OJC | 304 | 213 | 91 | 0 |
| 12+ credit hrs. | 214 | 206 | 8 | 0 |
| 1-11 credit hrs. | 90 | 7 | 83 | 0 |
| 0 credit hrs. | 0 | 0 | 0 | 0 |
| PPCC | 1,403 | 0 | 1,403 | 0 |
| 12+ credit hrs. | 458 | 0 | 458 | 0 |
| 1-11 credit hrs. | 939 | 0 | 939 | 0 |
| 0 credit hrs. | 6 | 0 | 6 | 0 |
| PCC | 295 | 295 | 0 | 0 |
| 12+ credit hrs. | 119 | 119 | 0 | 0 |
| 1-11 credit hrs. | 176 | 176 | 0 | 0 |
| 0 credit hrs. | 0 | 0 | 0 | 0 |
| RRCC | 890 | 468 | 422 | 0 |
| 12+ credit hrs. | 253 | 132 | 121 | 0 |
| 1-11 credit hrs. | 630 | 330 | 300 | 0 |
| 0 credit hrs. | 7 | 6 | 1 | 0 |
| TSJC | 823 | 527 | 295 | 1 |
| 12+ credit hrs. | 287 | 173 | 114 | 0 |
| 1-11 credit hrs. | 510 | 343 | 166 | 1 |
| 0 credit hrs. | 26 | 11 | 15 | 0 |

Table 13
(continued)

| | TOTAL STUDENTS | VOCATIONAL PROGRAM | TWO-YEAR PROGRAM | OTHER PROGRAM |
|---|---|---|---|---|
| AIMS | 1,759 | 447 | 1,310 | 2 |
| 12+ credit hrs. | 625 | 245 | 378 | 2 |
| 1-11 credit hrs. | 1,127 | 202 | 925 | 0 |
| 0 credit hrs. | 7 | 0 | 7 | 0 |
| CMC | 2,813 | 504 | 206 | 2,103 |
| 12+ credit hrs. | 239 | 158 | 80 | 1 |
| 1-11 credit hrs. | 269 | 51 | 55 | 163 |
| 0 credit hrs. | 2,305 | 295 | 71 | 1,939 |
| CNCC | 171 | 96 | 75 | 0 |
| 12+ credit hrs. | 157 | 85 | 72 | 0 |
| 1-11 credit hrs. | 14 | 11 | 3 | 0 |
| 0 credit hrs. | 0 | 0 | 0 | 0 |
| ASC | 119 | 0 | 119 | 0 |
| 12+ credit hrs. | 111 | 0 | 111 | 0 |
| 1-11 credit hrs. | 8 | 0 | 8 | 0 |
| 0 credit hrs. | 0 | 0 | 0 | 0 |
| MESA | 304 | 0 | 304 | 0 |
| 12+ credit hrs. | 202 | 0 | 202 | 0 |
| 1-11 credit hrs. | 98 | 0 | 98 | 0 |
| 0 credit hrs. | 4 | 0 | 4 | 0 |

Table 14
Ethnic Composition of Community College Cohort

| | N | Black | Indian | Hispanic | Asian | White |
|---|---|---|---|---|---|---|
| All students | 9,287 | 3.7% | 1.2% | 12.9% | 2.3% | 79.9% |
| CCCOES | | | | | | |
| ACC | 1,699 | 2.4% | 1.5% | 5.1% | 2.5% | 88.5% |
| CCA | 439 | 12.3% | 2.5% | 4.8% | 3.2% | 77.2% |
| CCD | 894 | 9.5% | 1.8% | 27.0% | 8.4% | 53.4% |
| FRCC | 1,091 | 1.8% | 0.9% | 9.4% | 3.5% | 84.3% |
| LCC | 175 | 3.4% | 1.1% | 10.9% | 0.0% | 84.6% |
| MCC | 250 | 0.0% | 0.4% | 6.8% | 0.4% | 92.4% |
| OJC | 302 | 0.0% | 0.7% | 30.5% | 0.0% | 68.9% |
| PPCC | 1,313 | 6.1% | 0.9% | 6.2% | 1.8% | 84.9% |
| PCC | 295 | 1.4% | 3.4% | 22.7% | 0.3% | 72.2% |
| RRCC | 820 | 1.1% | 1.3% | 6.7% | 0.6% | 90.2% |
| TSJC | 665 | 2.7% | 0.8% | 43.0% | 0.2% | 53.4% |
| Local district colleges | | | | | | |
| Aims | 433 | 1.2% | 0.2% | 11.5% | 1.2% | 85.9% |
| CMC | 336 | 0.9% | 0.6% | 1.8% | 0.6% | 96.1% |
| CNCC | 171 | 4.1% | 0.0% | 9.9% | 1.2% | 84.8% |
| State colleges offering two-year programs | | | | | | |
| ASC | 116 | 4.3% | 0.9% | 32.8% | 0.9% | 61.2% |
| Mesa | 288 | 2.8% | 0.7% | 4.5% | 0.3% | 91.7% |
| By program type | | | | | | |
| Vocational | 3,722 | 3.3% | 1.1% | 17.0% | 2.5% | 76.1% |
| Two-Year | 5,565 | 4.0% | 1.3% | 10.1% | 2.1% | 82.5% |
| By credit hours | | | | | | |
| Full-Time | 3,584 | 4.2% | 0.9% | 14.4% | 2.9% | 77.6% |
| Part-Time | 5,703 | 3.4% | 1.4% | 11.9% | 1.9% | 81.4% |

Table 15
Enrollment Status and Program Type by Ethnic Group
for the Community College Cohort

| | Black | Indian | Hispanic | Asian | White |
|---|---|---|---|---|---|
| All | 344<br>100.0% | 112<br>100.0% | 1,194<br>100.0% | 213<br>100.0% | 7,424<br>100.0% |
| Vocational | 121<br>35.2% | 42<br>37.5% | 633<br>53.0% | 94<br>44.1% | 2,829<br>38.1% |
| Two-year | 223<br>64.8% | 70<br>62.5% | 561<br>47.0% | 119<br>55.9% | 4,595<br>61.9% |
| Full-time | 150<br>43.3% | 31<br>27.7% | 516<br>43.2% | 105<br>49.3% | 2,784<br>37.5% |
| Part-time | 194<br>56.7% | 81<br>72.3% | 678<br>56.8% | 108<br>50.7% | 4,640<br>62.5% |

Table 16
Enrollment Status by Program Type by Ethnic Group
for the Community College Cohort

| | Black | Indian | Hispanic | Asian | White |
|---|---|---|---|---|---|
| Vocational | 121<br>100.0% | 42<br>100.0% | 633<br>100.0% | 94<br>100.0% | 2,829<br>100.0% |
| Full-time | 48<br>39.7% | 16<br>38.1% | 304<br>48.0% | 63<br>67.0% | 1,253<br>44.3% |
| Part-time | 73<br>60.3% | 26<br>61.9% | 329<br>52.0% | 31<br>33.0% | 1,576<br>55.7% |
| Two-year | 223<br>100.0% | 70<br>100.0% | 561<br>100.0% | 119<br>100.0% | 4,595<br>100.0% |
| Full-time | 102<br>45.7% | 15<br>21.4% | 212<br>37.8% | 42<br>35.3% | 1,531<br>33.3% |
| Part-time | 121<br>54.3% | 55<br>78.6% | 349<br>62.2% | 77<br>64.7% | 3.064<br>66.7% |

Table 17
Outcome by Program Type and Enrollment Status
for the Community College Cohort

| | No Degree No Transf. Not Enrolled in Year 3 | No Degree, No Transfer Still Enrolled | | Transferred to Four-Year School | | Rec'd Degree No Transfer | All Students | |
|---|---|---|---|---|---|---|---|---|
| | | Schl. of Origin | Other 2 yr. School | With Degree | No Degree | | % | N |
| All students | 68.0% | 15.7% | 1.7% | 0.8% | 9.0% | 4.8% | 100% | 9287 |
| **Program Type** | | | | | | | | |
| Vocational | 66.8% | 15.7% | 1.6% | 1.0% | 5.3% | 9.5% | 100% | 3722 |
| Two-year | 68.7% | 15.7% | 1.8% | 0.7% | 11.5% | 1.7% | 100% | 5565 |
| **Enrollment Status** | | | | | | | | |
| Full-time | 55.1% | 17.2% | 2.0% | 1.9% | 12.7% | 11.2% | 100% | 3584 |
| Part-time | 76.0% | 14.8% | 1.6% | 0.2% | 6.7% | 0.8% | 100% | 5703 |
| **Ethnicity** | | | | | | | | |
| Black | 74.7% | 17.7% | 0.9% | 0.0% | 5.2% | 1.5% | 100% | 344 |
| Indian | 79.5% | 8.9% | 2.7% | 0.9% | 7.1% | 0.9% | 100% | 112 |
| Hispanic | 70.7% | 16.3% | 1.3% | 0.5% | 4.6% | 16.3% | 110% | 1194 |
| Asian | 71.4% | 15.0% | 1.9% | 0.9% | 8.9% | 1.9% | 100% | 213 |
| White | 66.9% | 15.6% | 1.8% | 0.9% | 9.9% | 4.8% | 100% | 7424 |
| **Institution** | | | | | | | | |
| ACC | 73.2% | 12.6% | 1.6% | 0.3% | 9.8% | 2.4% | 100% | 1699 |
| CCA | 78.8% | 12.5% | 3.0% | 0.0% | 5.5% | 0.2% | 100% | 439 |
| CCD | 82.6% | 7.8% | 1.6% | 0.2% | 5.7% | 2.1% | 100% | 894 |
| FRCC | 71.2% | 15.4% | 1.6% | 0.4% | 8.0% | 3.5% | 100% | 1091 |
| LCC | 56.0% | 10.9% | 2.9% | 1.1% | 9.0% | 20.0% | 100% | 175 |
| MCC | 74.4% | 5.2% | 3.2% | 1.6% | 10.0% | 5.6% | 100% | 250 |
| OJC | 68.9% | 8.3% | 1.0% | 4.6% | 5.6% | 11.6% | 100% | 302 |
| PPCC | 61.6% | 26.6% | 0.7% | 0.1% | 9.4% | 1.6% | 100% | 1313 |
| PCC | 71.5% | 14.6% | 0.7% | 0.0% | 7.8% | 5.4% | 100% | 295 |
| RRCC | 75.5% | 11.2% | 2.1% | 0.5% | 8.9% | 1.8% | 100% | 820 |
| TSJC | 56.7% | 25.1% | 0.3% | 1.1% | 4.4% | 12.5% | 100% | 665 |
| AIMS | 43.4% | 18.7% | 4.6% | 4.8% | 24.5% | 3.9% | 100% | 433 |
| CMC | 49.4% | 13.4% | 0.9% | 1.8% | 11.6% | 22.9% | 100% | 336 |
| CNCC | 50.3% | 11.7% | 2.9% | 4.1% | 11.1% | 19.9% | 100% | 171 |
| ASC | 58.6% | 25.0% | 6.9% | 0.0% | 9.5% | 0.0% | 100% | 116 |
| MESA | 66.3% | 23.6% | 1.7% | 0.0% | 8.3% | 0.0% | 100% | 288 |

Note: If students had transferred to a four-year school or had received a degree, they are not counted in columns 2 or 3 even if they were enrolled in a two-year school.

Table 18
Receipt of Degree or Certificate in 1987 or 1988
from School of Origin
for the Community College Cohort

| | Receiving Any Degree | | Type of Degree or Certificate | | | | | |
|---|---|---|---|---|---|---|---|---|
| | % | N | 1-year certif. | 2-year certif. | 4-year certif. | AAS | AGS | AA or AS |
| All students | 5.6% | 523 | 9.6% | 26.4% | 3.8% | 38.6% | 1.3% | 20.3% |
| By program type | | | | | | | | |
| Vocational | 10.5% | 392 | 11.7% | 28.8% | 5.1% | 44.4% | 0.3% | 9.7% |
| Two-year | 2.4% | 131 | 3.1% | 19.1% | 0.0% | 21.4% | 4.6% | 51.9% |
| By enrollment status | | | | | | | | |
| Full-time | 13.1% | 468 | 8.5% | 25.4% | 4.3% | 40.8% | 0.9% | 20.1% |
| Part-time | 1.0% | 55 | 18.2% | 34.5% | 0.0% | 20.0% | 5.5% | 21.8% |
| By ethnicity | | | | | | | | |
| Black | 1.5% | 5 | * | * | * | * | * | * |
| Indian | 1.8% | 2 | * | * | * | * | * | * |
| Hispanic | 7.1% | 85 | 5.9% | 48.2% | 1.1% | 27.0% | 0.0% | 17.6% |
| Asian | 2.8% | 6 | * | * | * | * | * | * |
| White | 5.7% | 425 | 10.6% | 21.9% | 4.5% | 40.9% | 1.4% | 20.7% |
| By institution | | | | | | | | |
| ACC | 2.7% | 46 | 0.0% | 50.0% | 0.0% | 43.5% | 2.2% | 4.3% |
| CCA | 0.2% | 1 | * | * | * | * | * | * |
| CCD | 2.3% | 21 | 23.8% | 47.6% | 0.0% | 23.8% | 0.0% | 4.8% |
| FRCC | 3.8% | 42 | 26.2% | 28.6% | 4.8% | 33.3% | 0.0% | 7.1% |
| LCC | 21.1% | 37 | 0.0% | 43.2% | 24.3% | 18.9% | 0.0% | 13.5% |
| MCC | 7.2% | 18 | 0.0% | 61.1% | 0.0% | 11.1% | 0.0% | 27.8% |
| OJC | 16.2% | 49 | 2.0% | 32.7% | 0.0% | 20.4% | 0.0% | 44.9% |
| PPCC | 1.7% | 22 | 0.0% | 31.8% | 0.0% | 31.8% | 22.7% | 13.6% |
| PCC | 5.4% | 16 | 0.0% | 50.0% | 0.0% | 43.8% | 6.3% | 0.0% |
| RRCC | 2.3% | 19 | 31.6% | 5.3% | 0.0% | 42.1% | 0.0% | 21.1% |
| TSJC | 13.5% | 90 | 0.0% | 34.4% | 0.0% | 46.7% | 0.0% | 18.9% |
| Aims | 8.8% | 38 | 0.0% | 2.6% | 0.0% | 36.8% | 0.0% | 60.5% |
| CMC | 24.7% | 83 | 32.5% | 1.2% | 0.0% | 57.8% | 0.0% | 8.4% |
| CNCC | 24.0% | 41 | 0.0% | 2.4% | 22.0% | 41.5% | 0.0% | 34.1% |
| ASC | 0.0% | 0 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Mesa | 0.0% | 0 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |

Table 19
Success Rates for the Community College Cohort

| | Black | Indian | Hispanic | Asian | White | All |
|---|---|---|---|---|---|---|
| All students | 25.3 | 20.5 | 29.3 | 28.6 | 33.1 | 32.0 |
| By institution | | | | | | |
| ACC | 15.0 | 26.9 | 23.0 | 32.6 | 27.1 | 26.8 |
| CCA | 18.5 | 9.1 | 19.0 | 14.3 | 22.4 | 21.2 |
| CCD | 21.2 | 18.7 | 11.6 | 18.7 | 19.5 | 17.4 |
| FRCC | 30.0 | 20.0 | 24.3 | 36.8 | 29.0 | 27.8 |
| LCC | * | * | 42.1 | * | 45.9 | 44.0 |
| MCC | * | * | 11.8 | * | 26.8 | 25.6 |
| OJC | * | * | 23.9 | * | 34.6 | 31.1 |
| PPCC | 37.5 | 33.3 | 26.8 | 54.2 | 39.0 | 38.4 |
| PCC | * | 10.0 | 32.8 | * | 27.2 | 28.5 |
| RRCC | * | 18.2 | 7.3 | * | 26.1 | 24.5 |
| TSJC | 22.2 | * | 49.0 | * | 40.3 | 43.3 |
| Aims | * | * | 38.0 | * | 59.4 | 56.6 |
| CMC | * | * | * | * | 50.5 | 50.6 |
| CNCC | * | * | 52.9 | * | 51.0 | 49.7 |
| ASC | * | * | 36.8 | * | 46.5 | 41.4 |
| Mesa | * | * | 46.2 | * | 33.3 | 33.7 |
| By program type | | | | | | |
| Vocational | 23.1 | 16.7 | 34.9 | 30.9 | 33.5 | 33.2 |
| Two-year | 26.5 | 22.9 | 23.0 | 26.9 | 32.8 | 31.3 |
| By credit hours | | | | | | |
| Full-time | 30.9 | 32.3 | 33.1 | 41.9 | 48.0 | 44.9 |
| Part-time | 21.0 | 16.0 | 26.4 | 15.7 | 24.1 | 24.0 |

Table 20
Percentage of Community College Cohort Transferring to a Four-Year School

| | Blacks | Indians | Hispanics | Asians | Whites |
|---|---|---|---|---|---|
| ACC | 2.5% | 7.7% | 1.5% | 16.3% | 10.1% |
| CCA | 1.9% | 9.1% | 0.0% | 7.1% | 6.2% |
| CCD | 7.1% | 6.3% | 4.1% | 5.3% | 6.7% |
| FRCC | 5.0% | 10.0% | 4.9% | 2.6% | 9.0% |
| LCC | * | * | 0.0% | * | 12.2% |
| MCC | * | * | 0.0% | * | 12.5% |
| OJC | * | * | 2.2% | * | 14.0% |
| PPCC | 5.0% | 8.3% | 3.7% | 25.0% | 10.0% |
| PCC | * | 0.0% | 10.4% | * | 7.5% |
| RRCC | * | 18.2% | 1.8% | * | 10.0% |
| TSJC | 11.1% | * | 3.1% | * | 7.1% |
| AIMS | * | * | 8.0% | * | 32.3% |
| CMC | * | * | * | * | 13.3% |
| CNCC | * | * | 11.8% | * | 15.8% |
| ASC | * | * | 10.5% | * | 9.9% |
| MESA | * | * | 23.1% | * | 7.6% |
| All students | 5.2% | 8.0% | 5.1% | 9.8% | 10.8% |

Table 21
Detailed Outcomes for the Community College Cohort
by Ethnicity and School

| | No Deg No Tran Not Enrolled | No Deg No Tran Still Enrolled | No Deg Transfer to 4 yr. School | Rec'd Degree No Transfer | Rec'd Degree and Transfer | All Students (N) |
|---|---|---|---|---|---|---|
| **Blacks** | 74.7% | 18.6% | 5.2% | 1.5% | 0.0% | 344 |
| ACC | 85.0% | 10.0% | 2.5% | 2.5% | 0.0% | 40 |
| CCA | 81.5% | 16.7% | 1.9% | 0.0% | 0.0% | 54 |
| CCD | 78.8% | 12.9% | 7.1% | 1.2% | 0.0% | 85 |
| FRCC | 70.0% | 25.0% | 5.0% | 0.0% | 0.0% | 20 |
| LCC | x | x | x | x | x | 6 |
| MCC | x | x | x | x | x | 0 |
| OJC | x | x | x | x | x | 0 |
| PPCC | 62.5% | 31.3% | 5.0% | 1.3% | 0.0% | 80 |
| PCC | x | x | x | x | x | 4 |
| RRCC | x | x | x | x | x | 9 |
| TSJC | 77.8% | 0.0% | 11.1% | 11.1% | 0.0% | 18 |
| Aims | x | x | x | x | x | 5 |
| CMC | x | x | x | x | x | 3 |
| CNCC | x | x | x | x | x | 7 |
| ASC | x | x | x | x | x | 5 |
| Mesa | x | x | x | x | x | 8 |
| **Indians** | 79.5% | 11.6% | 6.3% | 0.9% | 1.8% | 112 |
| ACC | 73.1% | 19.2% | 7.7% | 0.0% | 0.0% | 26 |
| CCA | 90.9% | 0.0% | 9.1% | 0.0% | 0.0% | 11 |
| CCD | 81.3% | 12.5% | 0.0% | 0.0% | 6.3% | 16 |
| FRCC | 80.0% | 10.0% | 0.0% | 0.0% | 10.0% | 10 |
| LCC | x | x | x | x | x | 2 |
| MCC | x | x | x | x | x | 1 |
| OJC | x | x | x | x | x | 2 |
| PPCC | 66.7% | 25.0% | 8.3% | 0.0% | 0.0% | 12 |
| PCC | 90.0% | 0.0% | 0.0% | 10.0% | 0.0% | 10 |
| RRCC | 81.8% | 0.0% | 18.2% | 0.0% | 0.0% | 11 |
| TSJC | x | x | x | x | x | 5 |
| Aims | x | x | x | x | x | 1 |
| CMC | x | x | x | x | x | 2 |
| CNCC | x | x | x | x | x | 0 |
| ASC | x | x | x | x | x | 1 |
| Mesa | x | x | x | x | x | 2 |

Table 21
(continued)

| | No Deg No Tran Not Enrolled | No Deg No Tran Still Enrolled | No Deg Transfer to 4 yr. School | Rec'd Degree No Transfer | Rec'd Degree and Transfer | All Students (N) |
|---|---|---|---|---|---|---|
| **Hispanics** | 70.7% | 17.6% | 4.6% | 6.6% | 0.5% | 1194 |
| ACC | 77.0% | 10.3% | 11.5% | 1.1% | 0.0% | 87 |
| CCA | 81.0% | 19.0% | 0.0% | 0.0% | 0.0% | 21 |
| CCD | 88.4% | 6.2% | 4.1% | 1.2% | 0.0% | 241 |
| FRCC | 75.7% | 14.6% | 4.9% | 4.9% | 0.0% | 103 |
| LCC | 57.9% | 5.3% | 0.0% | 36.8% | 0.0% | 19 |
| MCC | 88.2% | 5.9% | 0.0% | 5.9% | 0.0% | 17 |
| OJC | 76.1% | 7.6% | 0.0% | 14.1% | 2.2% | 92 |
| PPCC | 73.2% | 22.0% | 3.7% | 1.2% | 0.0% | 82 |
| PCC | 67.2% | 20.9% | 10.4% | 1.5% | 0.0% | 67 |
| RRCC | 92.7% | 3.6% | 1.8% | 1.8% | 0.0% | 55 |
| TSJC | 51.0% | 32.2% | 2.8% | 13.6% | 0.3% | 286 |
| Aims | 62.0% | 30.0% | 4.0% | 0.0% | 4.0% | 50 |
| CMC | x | x | x | x | x | 6 |
| CNCC | 47.1% | 17.6% | 11.8% | 23.5% | 0.0% | 17 |
| ASC | 63.2% | 26.3% | 10.5% | 0.0% | 0.0% | 38 |
| Mesa | 53.8% | 23.1% | 23.1% | 0.0% | 0.0% | 13 |
| **Asians** | 71.4% | 16.9% | 8.9% | 1.9% | 0.9% | 213 |
| ACC | 67.4% | 16.3% | 14.0% | 0.0% | 2.3% | 43 |
| CCA | 85.7% | 0.0% | 7.1% | 7.1% | 0.0% | 14 |
| CCD | 81.3% | 12.0% | 4.0% | 1.3% | 1.3% | 75 |
| FRCC | 63.2% | 34.2% | 2.6% | 0.0% | 0.0% | 38 |
| LCC | x | x | x | x | x | 0 |
| MCC | x | x | x | x | x | 1 |
| OJC | x | x | x | x | x | 0 |
| PPCC | 45.8% | 25.0% | 25.0% | 4.2% | 0.0% | 24 |
| PCC | x | x | x | x | x | 1 |
| RRCC | x | x | x | x | x | 5 |
| TSJC | x | x | x | x | x | 1 |
| Aims | x | x | x | x | x | 5 |
| CMC | x | x | x | x | x | 2 |
| CNCC | x | x | x | x | x | 2 |
| ASC | x | x | x | x | x | 1 |
| Mesa | x | x | x | x | x | 1 |

Table 21
(continued)

| | No Deg No Tran Not Enrolled | No Deg No Tran Still Enrolled | No Deg Transfer to 4 yr. School | Rec'd Degree No Transfer | Rec'd Degree and Transfer | All Students (N) |
|---|---|---|---|---|---|---|
| Whites | 66.9% | 17.4% | 9.9% | 4.8% | 0.9% | 7424 |
| ACC | 72.9% | 14.4% | 9.8% | 2.6% | 0.3% | 1503 |
| CCA | 77.6% | 16.2% | 6.2% | 0.0% | 0.0% | 339 |
| CCD | 80.5% | 9.9% | 6.7% | 2.9% | 0.0% | 477 |
| FRCC | 71.0% | 16.4% | 8.6% | 3.6% | 0.4% | 920 |
| LCC | 54.1% | 14.9% | 10.8% | 18.9% | 1.4% | 148 |
| MCC | 73.2% | 8.7% | 10.8% | 5.6% | 1.7% | 231 |
| OJC | 65.4% | 10.1% | 8.2% | 10.6% | 5.8% | 208 |
| PPCC | 61.0% | 27.4% | 9.9% | 1.6% | 0.1% | 1115 |
| PCC | 72.8% | 13.1% | 7.5% | 6.6% | 0.0% | 213 |
| RRCC | 73.9% | 14.2% | 9.5% | 1.9% | 0.5% | 740 |
| TSJC | 59.7% | 21.4% | 5.4% | 11.8% | 1.7% | 355 |
| Aims | 40.6% | 22.6% | 27.2% | 4.6% | 5.1% | 372 |
| CMC | 49.5% | 14.6% | 11.8% | 22.6% | 1.5% | 323 |
| CNCC | 49.0% | 14.5% | 11.0% | 20.7% | 4.8% | 145 |
| ASC | 53.5% | 36.6% | 9.9% | 0.0% | 0.0% | 71 |
| Mesa | 66.7% | 25.8% | 7.6% | 0.0% | 0.0% | 264 |

Table 22
Summary Table: Comparison of Outcomes for Community College Cohort across Schools

**BLACK COHORT**

| | Any Positive Outcome | | | Transfer to 4-yr. School | | | |
|---|---|---|---|---|---|---|---|
| | Percent | Relative to All Blacks | Relative to Whites Same School | Percent | Relative to All Blacks | Relative to Whites Same School | Summary Score[1] |
| ACC | 15.00% | 0.59 | 0.55 | 2.5% | 0.48 | 0.25 | 0.45 |
| CCA | 18.52% | 0.73 | 0.83 | 1.9% | 0.37 | 0.31 | 0.56 |
| CCD | 21.18% | 0.84 | 1.09 | 7.1% | 1.37 | 1.06 | 1.08 |
| FRCC | 30.00% | 1.19 | 1.03 | 5.0% | 0.96 | 0.56 | 0.89 |
| LCC | * | * | * | * | * | * | * |
| MCC | * | * | * | * | * | * | * |
| OJC | * | * | * | * | * | * | * |
| PPCC | 37.50% | 1.48 | 0.96 | 5.0% | 0.96 | 0.50 | 0.89 |
| PCC | * | * | * | * | * | * | * |
| RRCC | * | * | * | * | * | * | * |
| TSJC | 22.22% | 0.88 | 0.55 | 11.1% | 2.13 | 1.56 | 1.21 |
| Aims | * | * | * | * | * | * | * |
| CMC | * | * | * | * | * | * | * |
| CNCC | * | * | * | * | * | * | * |
| ASC | * | * | * | * | * | * | * |
| Mesa | * | * | * | * | * | * | * |
| Avg. | 25.29% | 1.00 | 0.77 | 5.2% | 1.00 | 0.48 | 0.75 |

**INDIAN COHORT**

| | Any Positive Outcome | | | Transfer to 4-yr. School | | | |
|---|---|---|---|---|---|---|---|
| | Percent | Relative to All Indians | Relative to Whites Same School | Percent | Relative to All Indians | Relative to Whites Same School | Summary Score |
| ACC | 26.92% | 1.31 | 0.99 | 7.7% | 0.96 | 0.76 | 0.96 |
| CCA | 9.09% | 0.44 | 0.41 | 9.1% | 1.14 | 1.47 | 0.89 |
| CCD | 18.75% | 0.91 | 0.96 | 6.3% | 0.79 | 0.94 | 0.92 |
| FRCC | 20.00% | 0.97 | 0.69 | 10.0% | 1.25 | 1.11 | 0.97 |
| LCC | * | * | * | * | * | * | * |
| MCC | * | * | * | * | * | * | * |
| OJC | * | * | * | * | * | * | * |
| PPCC | 33.33% | 1.62 | 0.85 | 8.3% | 1.04 | 0.83 | 1.00 |
| PCC | 10.00% | 0.49 | 0.37 | 0.0% | 0.00 | 0.00 | 0.41 |
| RRCC | 18.18% | 0.89 | 0.70 | 18.2% | 2.28 | 1.82 | 1.37 |
| TSJC | * | * | * | * | * | * | * |
| AIMS | * | * | * | * | * | * | * |
| CMC | * | * | * | * | * | * | * |
| CNCC | * | * | * | * | * | * | * |
| ASC | * | * | * | * | * | * | * |
| MESA | * | * | * | * | * | * | * |
| Avg. | 20.54% | 1.00 | 0.62 | 8.0% | 1.00 | 0.74 | 0.79 |

[1]The summary measure is the average of the four index scores, with the indices relative to whites given double weighting.

Table 22
(Continued)

**HISPANIC COHORT**

| | Any Positive Outcome | | | Transfer to 4-yr. School | | | |
|---|---|---|---|---|---|---|---|
| | Percent | Relative to All Hispanics | Relative to Whites Same School | Percent | Relative to All Hispanics | Relative to Whites Same School | Summary Score |
| ACC | 23.0% | 0.78 | 0.85 | 11.5% | 2.25 | 1.14 | 1.17 |
| CCA | 19.0% | 0.65 | 0.85 | 0.0% | 0.00 | 0.00 | 0.78 |
| CCD | 11.6% | 0.40 | 0.60 | 4.1% | 0.80 | 0.61 | 0.60 |
| FRCC | 24.3% | 0.83 | 0.84 | 4.9% | 0.96 | 0.54 | 0.76 |
| LCC | 42.1% | 1.44 | 0.92 | 0.0% | 0.00 | 0.00 | 0.54 |
| MCC | 11.8% | 0.40 | 0.44 | 0.0% | 0.00 | 0.00 | 0.43 |
| OJC | 23.9% | 0.82 | 0.69 | 2.2% | 0.43 | 0.16 | 0.49 |
| PPCC | 26.8% | 0.92 | 0.69 | 3.7% | 0.73 | 0.37 | 0.63 |
| PCC | 32.8% | 1.12 | 1.21 | 10.4% | 2.04 | 1.39 | 1.39 |
| RRCC | 7.3% | 0.25 | 0.28 | 1.8% | 0.35 | 0.18 | 0.25 |
| TSJC | 49.0% | 1.67 | 1.22 | 3.1% | 0.61 | 0.44 | 0.93 |
| AIMS | 38.0% | 1.30 | 0.64 | 8.0% | 1.57 | 0.25 | 0.77 |
| CMC | * | * | * | * | * | * | * |
| CNCC | 52.9% | 1.81 | 1.04 | 11.8% | 2.31 | 0.75 | 1.28 |
| ASC | 36.8% | 1.26 | 0.79 | 10.5% | 2.06 | 1.06 | 1.17 |
| MESA | 46.2% | 1.57 | 1.38 | 23.1% | 4.53 | 3.04 | 2.49 |
| Avg. | 28.6% | 1.00 | 0.87 | 9.8% | 1.00 | 0.91 | 0.92 |

**ASIAN COHORT**

| | Any Positive Outcome | | | Transfer to 4-yr. School | | | |
|---|---|---|---|---|---|---|---|
| | Percent | Relative to All Asians | Relative to Whites Same School | Percent | Relative to All Asians | Relative to Whites Same School | Summary Score |
| ACC | 32.6% | 1.14 | 1.20 | 16.3% | 1.66 | 1.61 | 1.40 |
| CCA | 14.3% | 0.50 | 0.64 | 7.1% | 0.72 | 1.15 | 0.80 |
| CCD | 18.7% | 0.65 | 0.96 | 5.3% | 0.54 | 0.79 | 0.78 |
| FRCC | 36.8% | 1.29 | 1.27 | 2.6% | 0.27 | 0.29 | 0.78 |
| LCC | * | * | * | * | * | * | * |
| MCC | * | * | * | * | * | * | * |
| OJC | * | * | * | * | * | * | * |
| PPCC | 54.2% | 1.89 | 1.39 | 25.0% | 2.55 | 2.50 | 2.04 |
| PCC | * | * | * | * | * | * | * |
| RRCC | * | * | * | * | * | * | * |
| TSJC | * | * | * | * | * | * | * |
| AIMS | * | * | * | * | * | * | * |
| CMC | * | * | * | * | * | * | * |
| CNCC | * | * | * | * | * | * | * |
| ASC | * | * | * | * | * | * | * |
| MESA | * | * | * | * | * | * | * |
| Avg. | 28.6% | 1.00 | 0.87 | 9.8% | 1.00 | 0.91 | 0.92 |

Table 22
(Continued)

WHITE COHORT[1]

| | Any Positive Outcome | | | Transfer to 4-yr. School | | | |
|---|---|---|---|---|---|---|---|
| | Percent | Relative to All Whites | Relative to Whites Same School | Percent | Relative to All Whites | Relative to Whites Same School | Summary Score |
| ACC | 27.1% | 0.82 | 1.00 | 10.1% | 0.94 | 1.00 | 0.88 |
| CCA | 22.4% | 0.68 | 1.00 | 6.2% | 0.57 | 1.00 | 0.63 |
| CCD | 19.5% | 0.59 | 1.00 | 6.7% | 0.62 | 1.00 | 0.61 |
| FRCC | 29.0% | 0.88 | 1.00 | 9.0% | 0.83 | 1.00 | 0.86 |
| LCC | 45.9% | 1.39 | 1.00 | 12.2% | 1.13 | 1.00 | 1.26 |
| MCC | 26.8% | 0.81 | 1.00 | 12.5% | 1.16 | 1.00 | 0.98 |
| OJC | 34.6% | 1.05 | 1.00 | 14.0% | 1.30 | 1.00 | 1.17 |
| PPCC | 39.0% | 1.18 | 1.00 | 10.0% | 0.93 | 1.00 | 1.05 |
| PCC | 27.2% | 0.82 | 1.00 | 7.5% | 0.69 | 1.00 | 0.76 |
| RRCC | 26.1% | 0.79 | 1.00 | 10.0% | 0.93 | 1.00 | 0.86 |
| TSJC | 40.3% | 1.22 | 1.00 | 7.1% | 0.66 | 1.00 | 0.94 |
| AIMS | 59.4% | 1.80 | 1.00 | 32.3% | 2.99 | 1.00 | 2.39 |
| CMC | 50.5% | 1.53 | 1.00 | 13.3% | 1.23 | 1.00 | 1.38 |
| CNCC | 51.0% | 1.54 | 1.00 | 15.8% | 1.46 | 1.00 | 1.50 |
| ASC | 46.5% | 1.41 | 1.00 | 9.9% | 0.92 | 1.00 | 1.16 |
| MESA | 33.3% | 1.01 | 1.00 | 7.6% | 0.70 | 1.00 | 0.86 |
| Avg. | 33.1% | 1.00 | 1.00 | 10.8% | 1.00 | 1.00 | 1.00 |

[1]Summary score for whites is the average of Index 1 and Index 3.

## APPENDIX C

## INTERVIEW PROTOCOLS

1. ADMINISTRATIVE SURVEY
2. FACULTY SURVEY
3. STUDENT SURVEY

## Administrators Survey

DIRECTIONS: Please respond to all parts of this questionnaire.

1. Name of institution:

2. Address:

3. Administrative Appointment:

4. Approximately what percent of your institution's budget is targeted for the development of special programs designed for recruitment, retention and achievement of minority students?

5. Do you do anything special for minority students on this campus that might account for successful outcomes or are all students treated the same?

6. What are the barriers that impede minority student achievement on this campus?

7. What percent of your colleges' admission window is used to admit minority students?

8. What is the most important equity action in which your institution engages?

9. What are the most important strategies designed at your campus to recruit minority students?

10. What are the most important strategies designed at your campus to retain and foster academic achievement of minority students (i.e., residence halls, early reach out programs, special financial aid programs, etc.)?

11. What factors attract minority students to your college? (Check all that apply)

_____ location
_____ college reputation
_____ cost
_____ availability of financial aid
_____ quality of academic programs

_____ critical mass of minority students
_____ critical mass of minority faculty
_____ special support programs
_____ special admissions practices
_____ cultural events
_____ other:

12. Of the above, which are the three most important?

13. To what extent are minority and majority faculty involved in programs designed to enhance academic achievement for minorities?

14. What does the institution do to recruit minority faculty and staff?

15. Does the institution have evaluative information on the status and progress of minority students? What are the major lessons the college has learned from these evaluations?

16. Are there any special elements in place to foster a positive campus climate for minorities (i.e., role models, critical mass of minorities, etc.)?

17. Does the institution have policy statements or goals reflecting a commitment to recruiting and enhancing the retention of minority students? Explain these statements and how they are communicated to faculty and students.

18. Outside of your own institution, which three programs in the state do you consider to be particularly effective in the retention and academic achievement of minority students?

    a. Name of program:

    b. Institution:

    c. Program objective:

    a. Name of program:

    b. Institution:

    c. Program objective:

a. Name of program:

b. Institution:

c. Program objective:

19. Which do you consider to be the top three programs on your campus that are particularly effective in the retention and academic achievement of minority students?

a. Name of program:

b. Dept./Division:

c. Program Director:

a. Name of program:

b. Dept./Division:

c. Program Director:

a. Name of program:

b. Dept./Division:

c. Program Director:

For each of the above three programs, please complete the attached form.

## EXEMPLARY PROGRAMS

1. Name of Program:

2. Where is the program located?

   _____ a. Within and part of an academic department
   _____ b. Within and part of a student services department
   _____ c. Outside of an academic or student services department
   _____ d. Other:

3. How does your administrative office support the existence of this program?

4. Which of the following factors does the program address? (Check all items that apply)

| | Yes | No |
|---|---|---|
| Student academic integration | _____ | _____ |
| Faculty/Student interact (both social & academic) | _____ | _____ |
| Student goal commitments | _____ | _____ |
| Student institutional (or program) commitments | _____ | _____ |
| Student financial needs and assistance | _____ | _____ |
| Student transfer | _____ | _____ |

| | | |
|---|---|---|
| Non-faculty staff involvement | ____ | ____ |
| Student attrition rates | ____ | ____ |
| Student recruitment of potential Students and student/institution interaction prior to enrollment | ____ | ____ |
| Physical integration of students with their environment | ____ | ____ |
| Discriminatory attitudes against students on campus | ____ | ____ |

5. How is this program meeting the institution's goals?

6. What problem(s) is this program trying to address?

7. Which outcomes (i.e., retention rates, GPAs, transfer rates, etc.) are particularly impressive about this program?

8. Do you feel this program is held in high regard and supported by the institution at large? Why or why not?

9. What would you consider to be the weaknesses (if any) of this program?

10. What do you consider are the most outstanding features of this program? In other words, what makes the program work?

11. What CCHE policies, if any, to you believe inhibit the institution's success in graduating minority students?

**Faculty Survey of Factors Related to Persistence**

## ACADEMIC INTEGRATION

1. What kinds of nonclassroom interactions with students have you had that you believe influence their:

    a. ...personal growth and attitudes?

    b. ...academic skills and abilities?

    c. ...career goals and aspirations?

2. What do faculty on campus do to encourage participation in class discussion?

3. What do faculty on campus do to encourage students to visit the library for study and/or research purposes?

## SOCIAL INTEGRATION

1. What kinds of opportunities are available for students to develop close personal relationships with other students?

2. What kinds of opportunities are available for students to develop close personal relationships with faculty members, academic advisors or academic staff members?

## EDUCATIONAL GOALS

1. What do faculty at this institution do to help students develop or support their educational goals?

## INSTITUTIONAL GOALS

1. What attracts minority students to attend this college?

2. How are minority students helped to develop a sense of belonging at this institution?

3. For minority students selecting a college, how important is the prestige of this institution?

## FINANCIAL ASSISTANCE

1. Overall, do you believe that minority students at your institution are satisfied with the financial aid advisement that they receive? Why or why not?

2. What financial aid programs do you believe have made a difference for minority students?

## PHYSICAL INTEGRATION WITH THE ENVIRONMENT

1. What do faculty do at your institution to make it easier for minorities to get around the campus?

2. Are there any activities on your campus that help the student to know where to go for information or advisement during their first year?

## ATTITUDES ABOUT ETHNIC DISCRIMINATION

1. Do you believe that there is a general atmosphere of prejudice among the following three groups? (Briefly discuss discriminatory attitudes or practices.)

    a. students?

b. faculty?

c. staff other than classroom teachers?

2. What does the institution do to foster ethnic pride among students and faculty?

## GETTING READY

1. What opportunities exist on your campus for faculty to become involved in activities that bring potential students to the institution before enrollment dates?

## OTHER RELATED FACTORS

1. Do you do anything special for minority students on this campus that might account for successful outcomes or are all students treated the same?

2. What are the barriers that impede minority student achievement on this campus?

3. What are the most important retention strategies designed at your campus to retain minority students (e.g., residence halls, early reach out programs, special financial aid programs, etc.)?

4. How are minority and majority faculty involved in programs designed to enhance academic achievement for minorities?

5. What does the institution do to recruit minority faculty and staff?

6. Does the institution have evaluative information on the status and progress of minority students? What are the major lessons the college has learned from these evaluations?

7. Does the institution have policy statements or goals reflecting a commitment to recruiting and enhancing the retention of minority students? Explain these statements and how they are communicated to faculty and students.

8. What three programs on this campus do you consider to be particularly effective in the retention and academic achievement of minority students?

**Student Survey of Factors**
**Related to Persistence**

## ACADEMIC INTEGRATION

1. What kinds of interactions with faculty outside of class have you had that you believe influence your:

   a. ...personal growth and attitudes?

   b. ...academic skills and abilities?

   c. ...career goals and aspirations?

2. Why do you feel students don't meet with faculty outside of class?

3. What teaching practices have faculty used to get students excited about learning?

4. What is it about certain classes that make students participate in class discussion?

5. What programs on campus allow students to meet with other students to:

   a. ...discuss class-related issues?

   b. ...engage in cultural events (for example, concerts, lectures, art shows)?

   c. ...engage in extracurricular events?

6. What do faculty do on this campus to encourage students to use the library for study and/or research purposes?

7. How do minority students at this campus study to pass their courses?

## SOCIAL INTEGRATION

1. Since enrolling at this institution, how have you developed close personal relationships with other students?

2. Since enrolling at this institution, how have you developed close personal relationships with faculty members, academic advisors or academic staff members?

## EDUCATIONAL GOAL COMMITMENTS

1. How important is it for minority students to get college degrees?

2. Since enrolling at this college, how have you learned about how important it is to finish your program of study?

## INSTITUTIONAL GOAL COMMITMENTS

1. What attracts minority students to attend this college?

2. How are minority students helped to develop a sense of belonging at this institution?

3. For minority students selecting a college, how important is the prestige of this institution?

## FINANCIAL ASSISTANCE

1. What kind of financial aid advisement is available to minority students at this institution?

2. What can your college do to provide better financial aid programs for minority students?

## PHYSICAL INTEGRATION WITH THE ENVIRONMENT

1. What did your faculty at your institution do to make it easier for minorities to get around the campus?

2. What activities on your campus help minorities to know where to go for information or advisement during their first year?

## ATTITUDES ABOUT ETHNIC DISCRIMINATION

1. Do you believe that there is a general atmosphere of prejudice among the following three groups. (Briefly discuss discriminatory attitudes or practices.)

   a. students?

   b. faculty?

   c. staff other than classroom teachers?

2. What does the institution do to foster ethnic pride among students and faculty?

## GETTING READY

1. Are there opportunities for minority students to become involved in activities on your campus before enrolling?

## PERSISTENCE/TRANSFER

1. What opportunities exist for minority students to discuss dropping out with faculty, academic staff members or other students?

2. What programs or offices on campus provide information on transferring?

3. What services can you college provide to help minority students continue their education?

4. What CCHE policies, if any, do you believe inhibit the institution's success in graduating minority students?